

ANTARCTIC ICE CHARTS 1987-1988

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PREPARED BY
NAVAL POLAR OCEANOGRAPHY CENTER
SUITLAND, MD

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FOREWORD

The U.S. Navy has a long and eventful history of polar exploration from Robert E. Peary in the Arctic to Richard E. Byrd in the Antarctic. In recent years the strategic importance and expanded research pursuits in these areas have resulted in greater national and international requirements for environmental information. Since 1976, the National Oceanic and Atmospheric Administration (NOAA) and the Navy have worked together at the Joint Ice Center (JIC) in Suitland, Maryland. By combining the Navy's experience in observing and recording sea ice data, and NOAA's expertise in satellite data collection and interpretation, the JIC has been able to keep pace with that demand in both polar regions.

This publication is the 8th edition in a continuing bi-yearly series of Antarctic sea ice atlases prepared by the JIC. The atlas contains weekly charts depicting Southern Hemisphere ice conditions and extent. The significant use of high resolution satellite imagery has greatly improved the accuracy of these analyses.

The purpose of this atlas is to provide the user with reliable weekly hemispheric ice analyses. Both Navy and NOAA personnel with considerable experience in sea ice analysis prepare the analyses. The following procedures have been developed to ensure the quality of the final products:

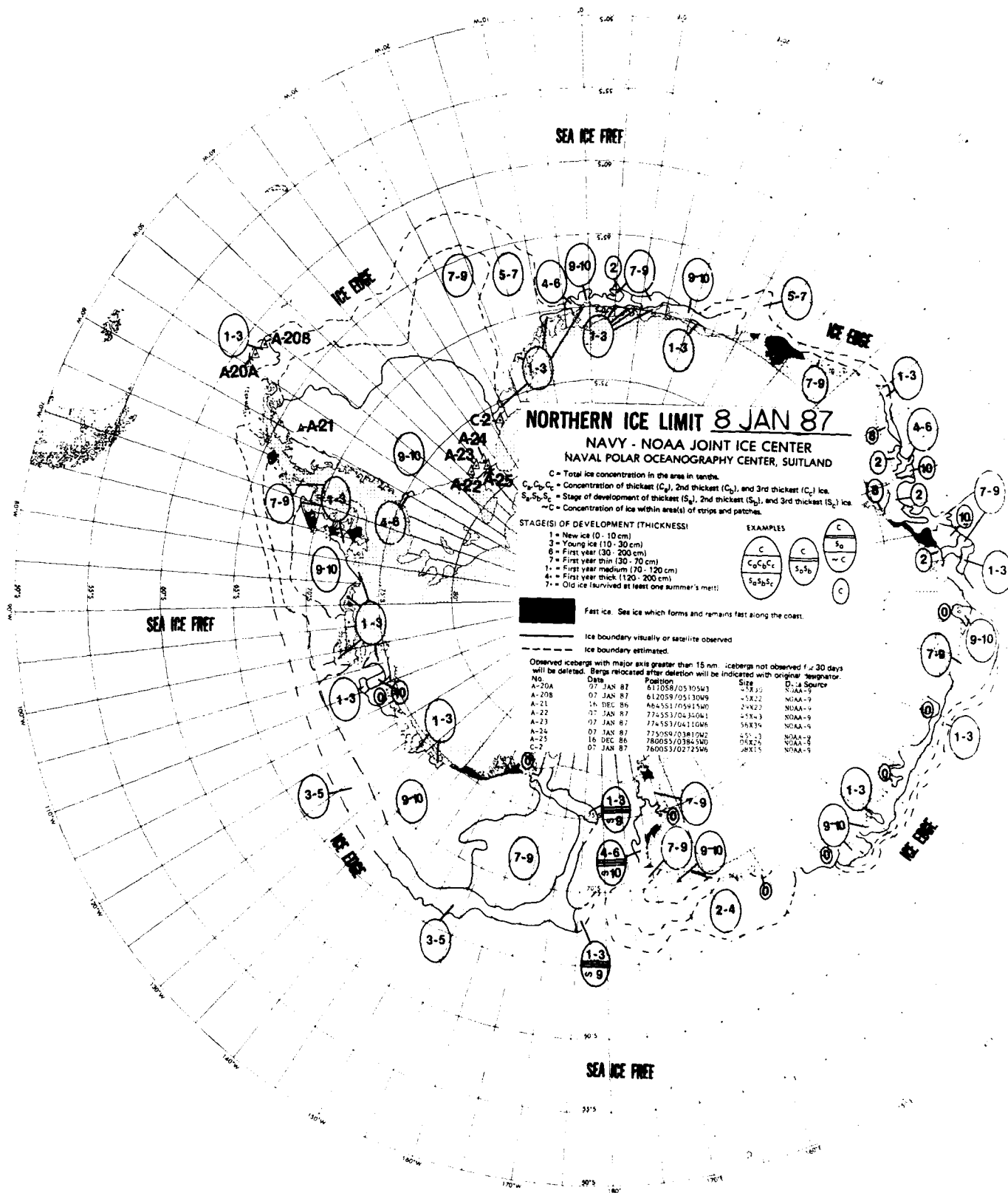
a. Satellite data from different sensors is compared and analyzed for ice information content. Table I, located on the inside back cover, summarizes satellite data available during 1987 and 1988.

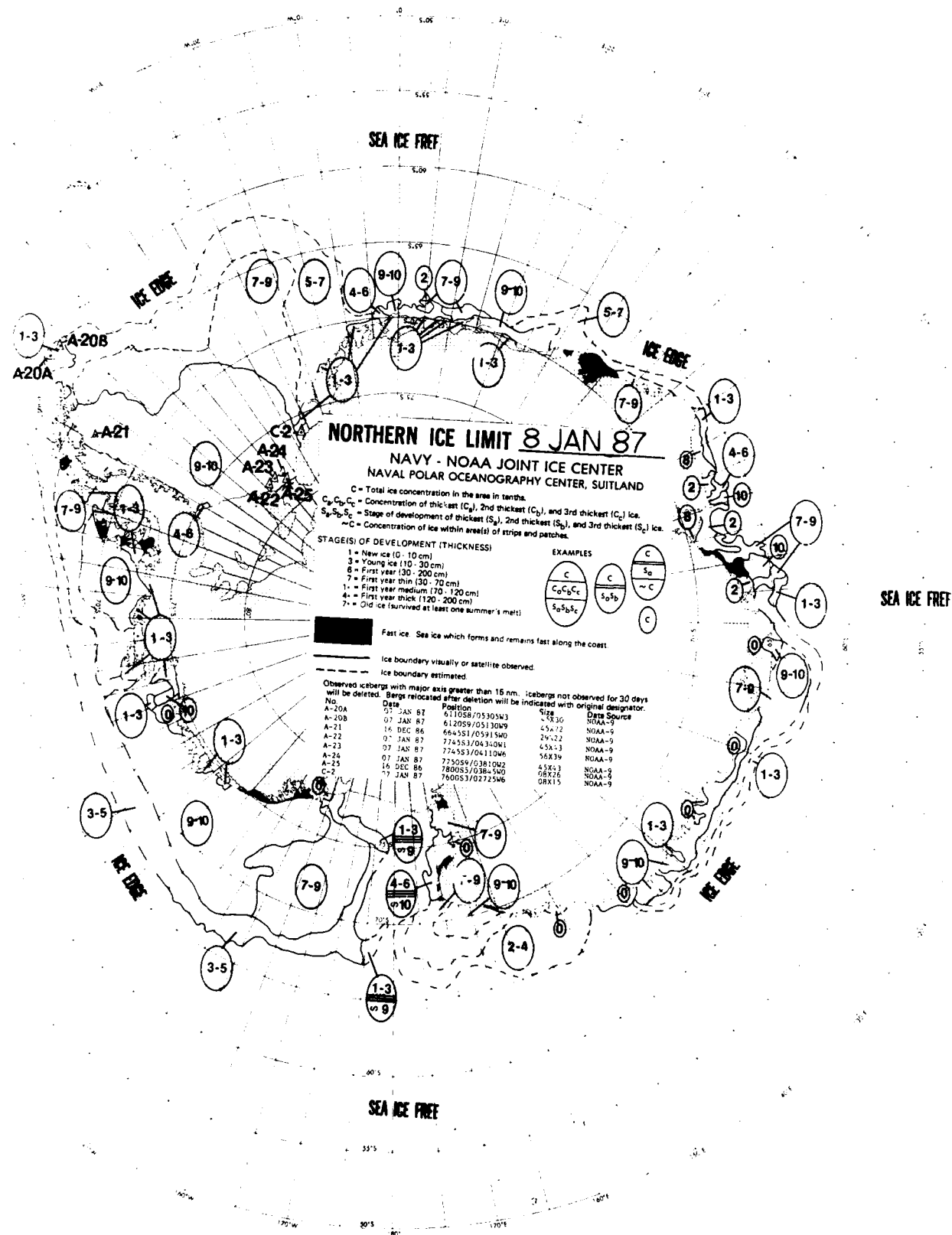
b. Where insufficient data is available, an estimated boundary will be depicted. Meteorological data and theoretical ice drift data are utilized to determine the estimated ice edge position.

Navy/NOAA Joint Ice Center
Naval Polar Oceanography Center
4301 Suitland Road
Washington, DC 20395-5180

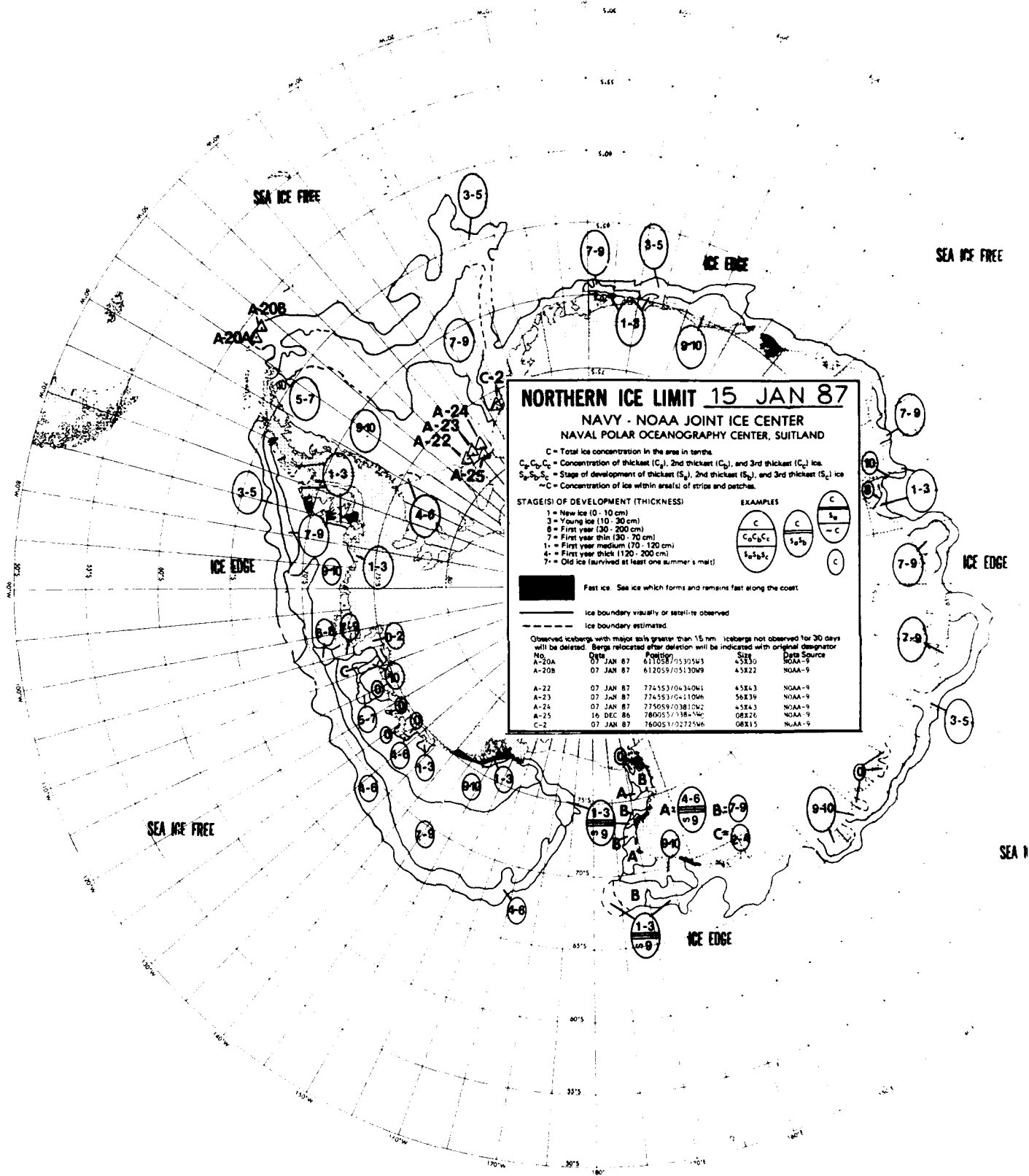
REPORT DOCUMENTATION PAGE

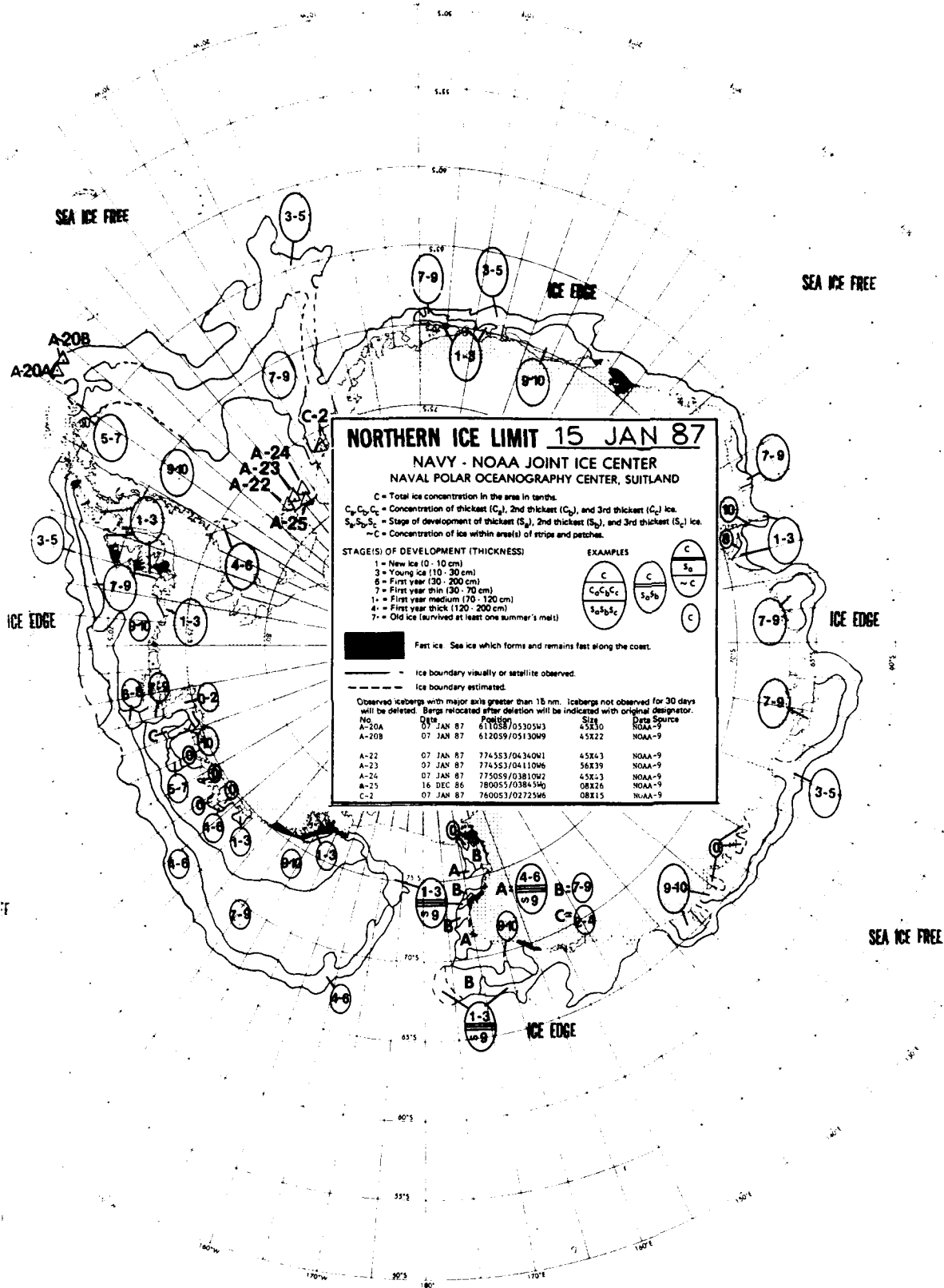
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FIELD	GROUP	SUB-GROUP	
		Sea ice, polar ice fields, satellite imagery, concentration stage of development, fast ice, concentration of thickness, theoretical thickness, Arctic	
19 ABSTRACT (Continue on reverse if necessary and identify by block number) These are approximately 7-day analyses of sea ice prepared by the Naval Polar Oceanography Center, Suitland, MD. Included are ice concentrations and ice thickness (age). <i>✓</i>			
20 DISTRIBUTION/AVAILABILITY OF ABSTRACT <input type="checkbox"/> UNCLASSIFIED/UNLIMITED <input checked="" type="checkbox"/> SAME AS RPT <input type="checkbox"/> DTIC USERS		21 ABSTRACT SECURITY CLASSIFICATION Unclassified	
22a NAME OF RESPONSIBLE INDIVIDUAL Brian L. Wallace		22b TELEPHONE (Include Area Code) (704) 252-7865	22c OFFICE SYMBOL

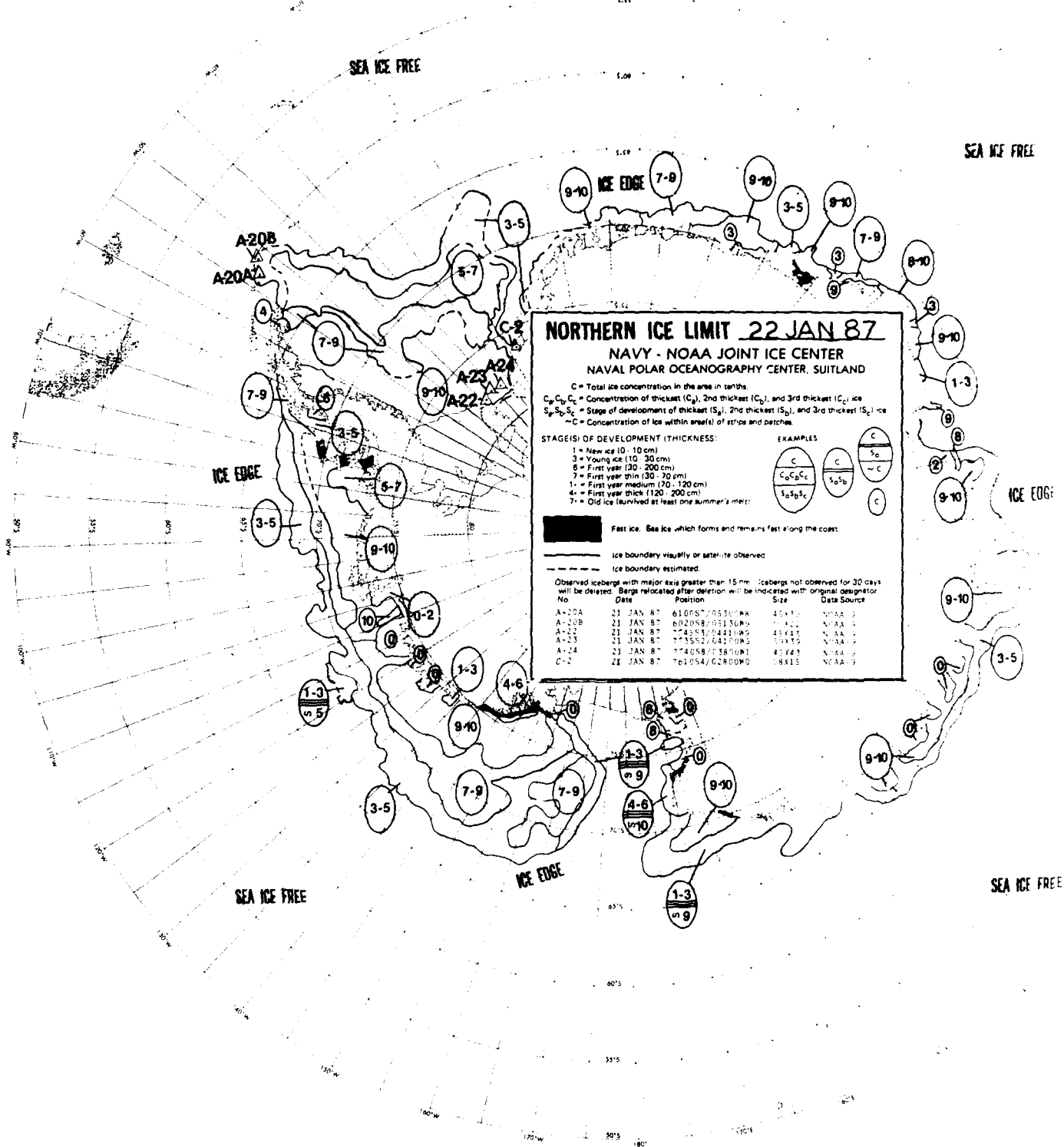




A-1







SEA ICE FREE

SEA ICE FREE

NORTHERN ICE LIMIT 22 JAN 87

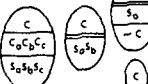
NAVY - NOAA JOINT ICE CENTER
NAVAL POLAR OCEANOGRAPHY CENTER, SUITLAND

C = Total ice concentration in the area in tenths.
 C_1, C_2, C_3 = Concentration of thickest (C_1), 2nd thickest (C_2), and 3rd thickest (C_3) ice.
 S_1, S_2, S_3 = Stage of development of thickest (S_1), 2nd thickest (S_2), and 3rd thickest (S_3) ice.
 ~C = Concentration of ice within area(s) of stripe and patches.

STAGE(S) OF DEVELOPMENT (THICKNESS):

- 1 = New ice (10 - 10 cm)
 3 = Young ice (10 - 30 cm)
 6 = First year (30 - 200 cm)
 7 = First year thin (30 - 70 cm)
 1 = First year medium (70 - 120 cm)
 4 = First year thick (120 - 200 cm)
 7 = Old ice (survived at least one summer's melt)

EXAMPLES



Fast ice. See ice which forms and remains fast along the coast.

Ice boundary visually or satellite observed.

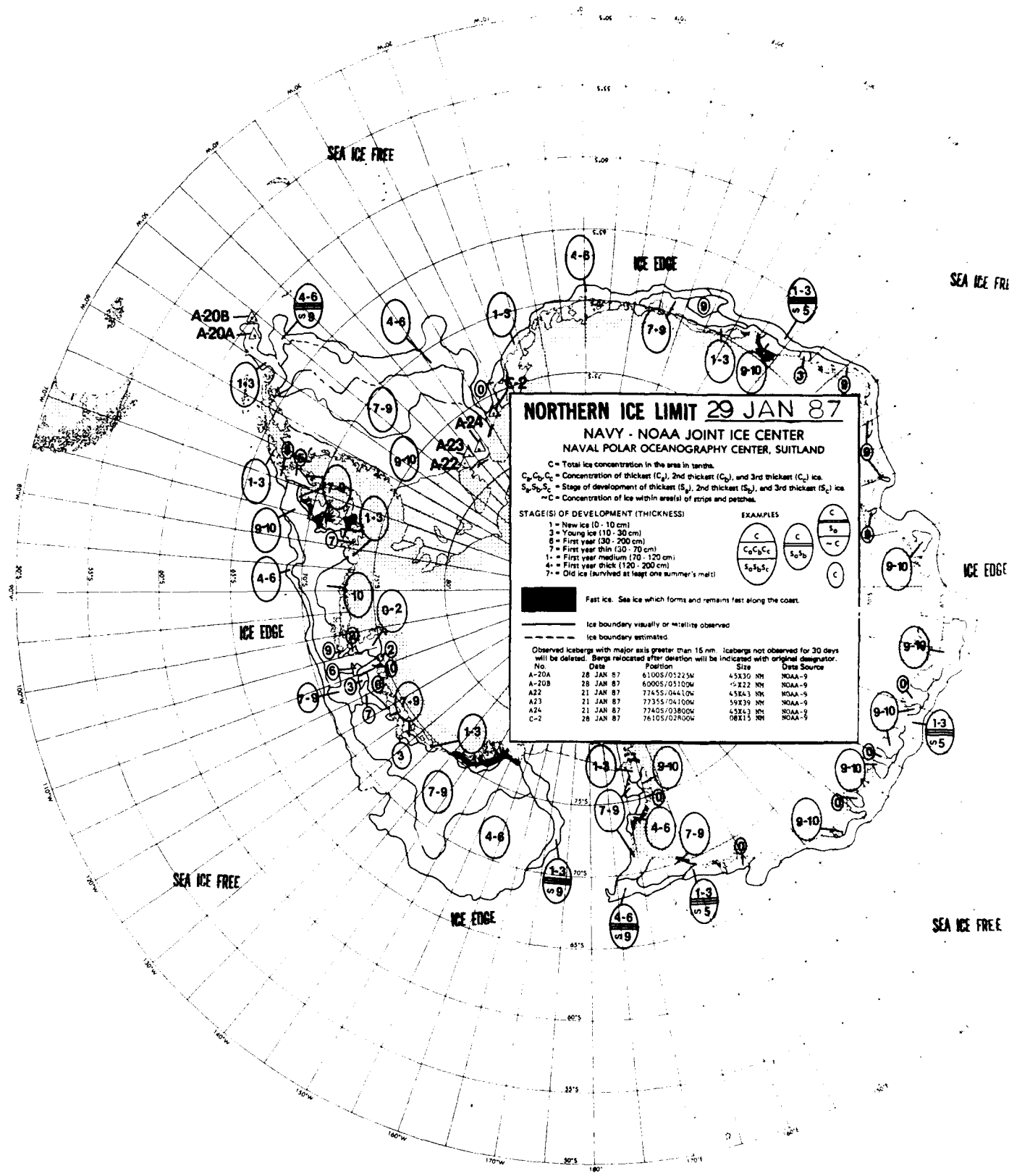
Ice boundary estimated.
 Observed icebergs with major axis greater than 15 nm. Icebergs not observed for 30 days will be deleted. Bergs relocated after deletion will be indicated with original designator.

No.	Date	Position	Size	Data Source
A-20A	21 JAN 87	610057/0530008	45X10	NOAA-9
A-20B	21 JAN 87	602058/0511009	11X12	NOAA-9
A-22	21 JAN 87	774553/0441009	45X43	NOAA-9
A-23	21 JAN 87	775352/0410005	59X39	NOAA-9
A-24	21 JAN 87	774058/0380001	45X43	NOAA-9
C-2	21 JAN 87	761054/0280000	98X15	NOAA-9

ICE EDGE

SEA ICE FREE

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NORTHERN ICE LIMIT 29 JAN 87

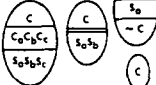
**NAVY - NOAA JOINT ICE CENTER
NAVAL POLAR OCEANOGRAPHY CENTER, SUITLAND**

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 $\sim C$ = Concentration of ice within areal of strips and patches.

STAGE(S) OF DEVELOPMENT (THICKNESS)

- 1 = New ice (10 - 10 cm)
- 3 = Young ice (110 - 30 cm)
- 6 = First year (30 - 200 cm)
- 7 = First year thin (30 - 70 cm)
- 1+ = First year medium (70 - 120 cm)
- 4+ = First year thick (120 - 200 cm)
- 7+ = Old ice (survived at least one summer's melt)

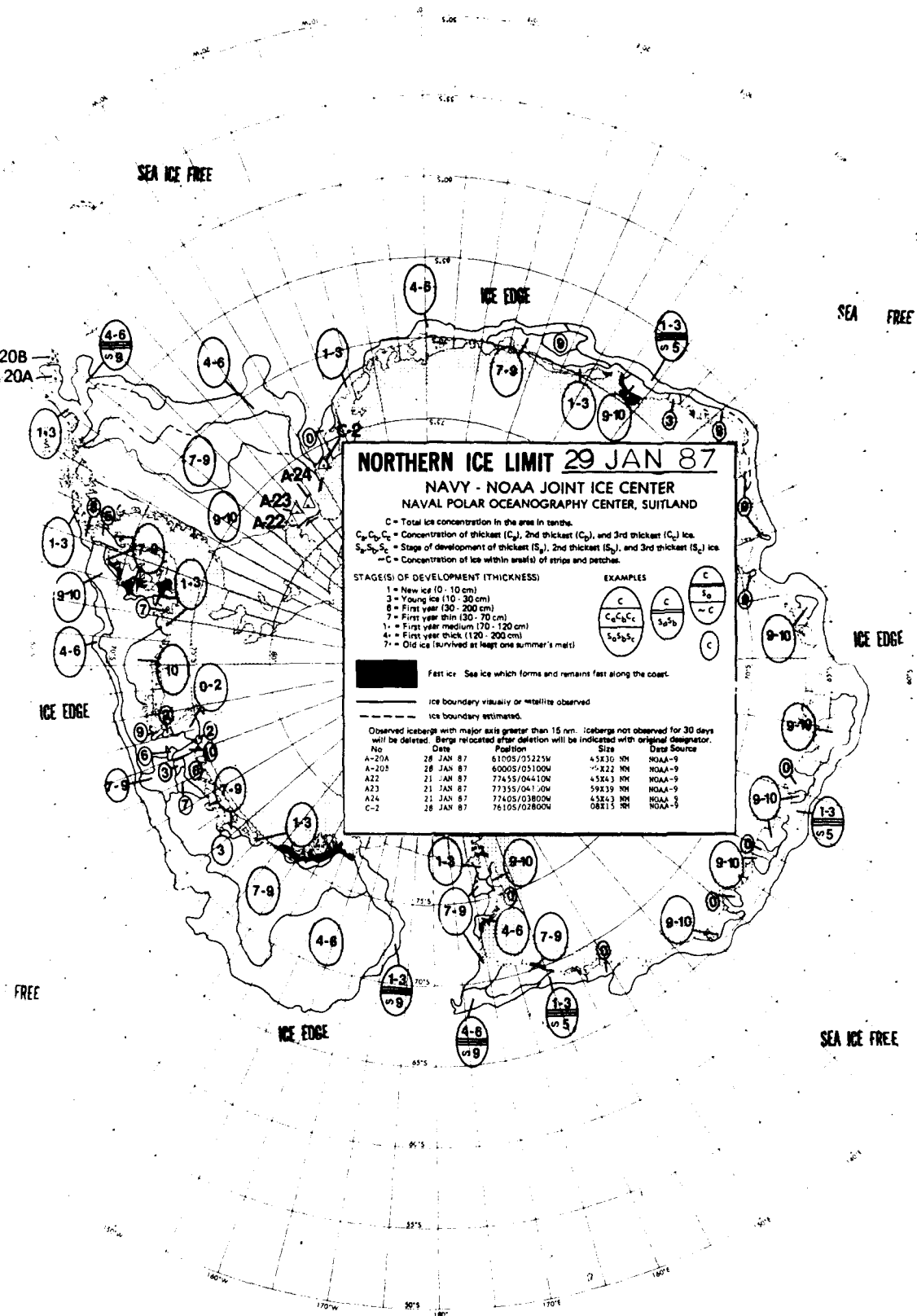
EXAMPLES

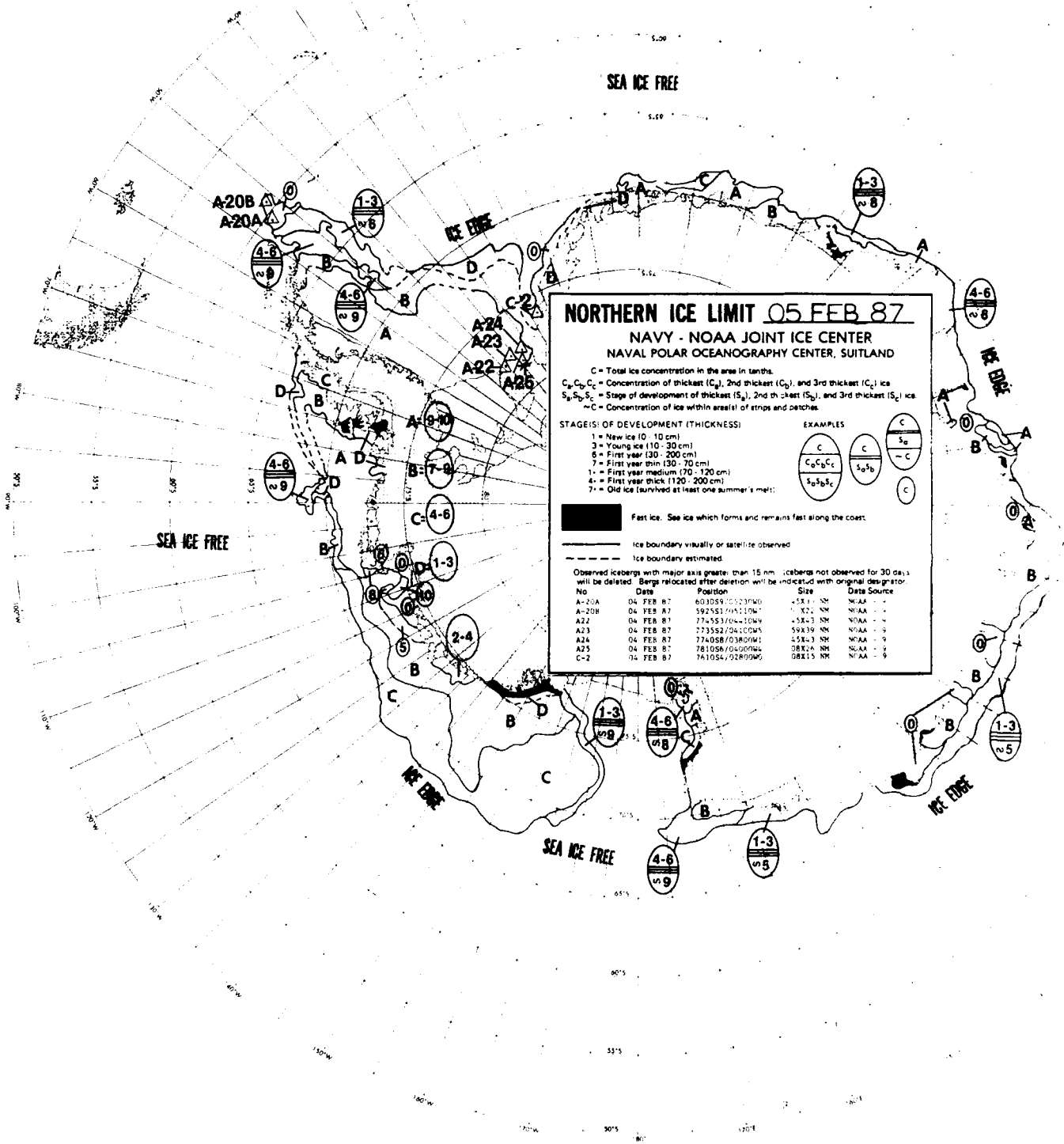


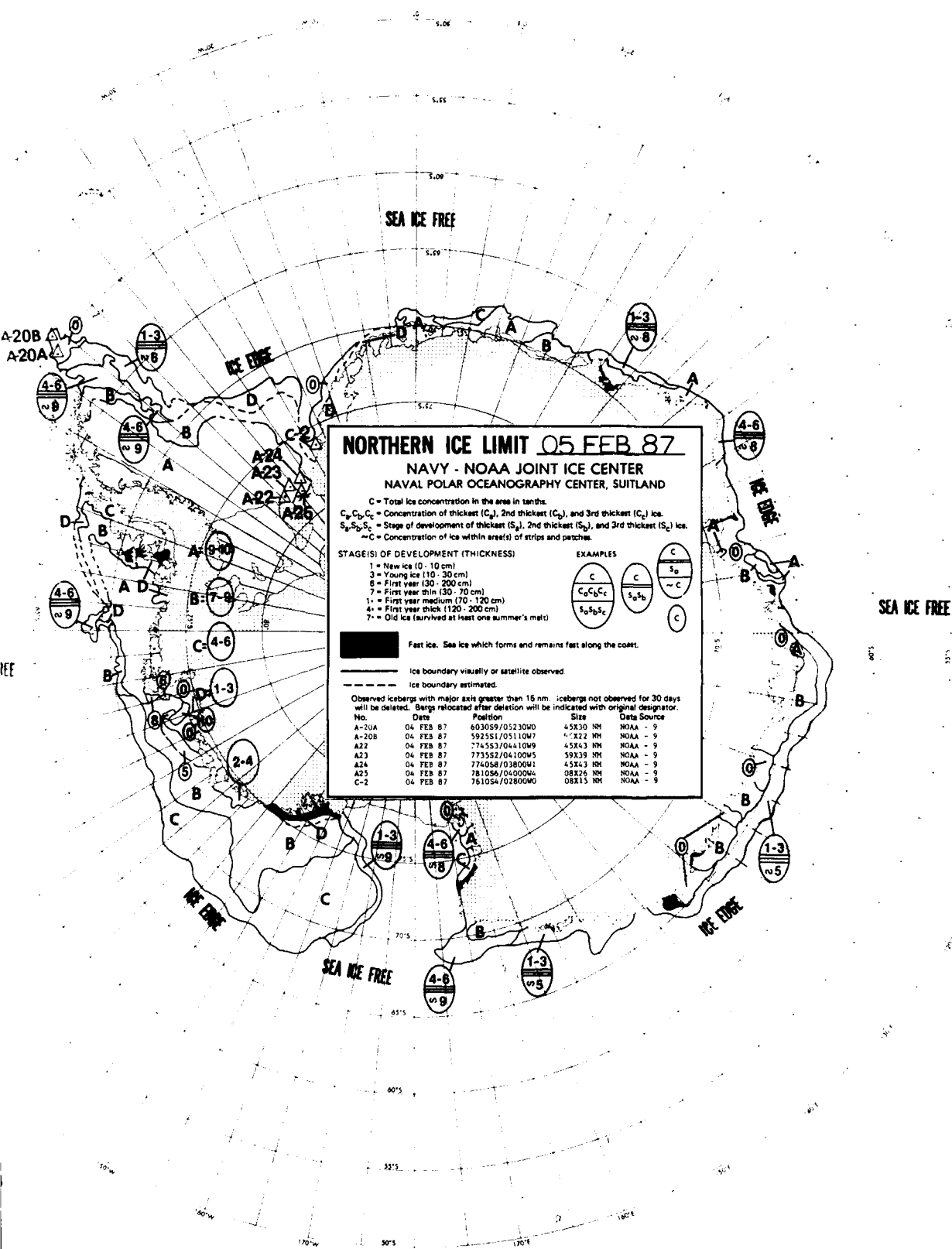
Fast ice. Sea ice which forms and remains fast along the coast.
 --- Ice boundary visually or reliably observed
 --- Ice boundary estimated

Observed icebergs with major axis greater than 15 nm. Icebergs not observed for 30 days will be deleted. Berge relocated after deletion will be indicated with original designator.

No.	Date	Position	Size	Date Source
A-20A	28 JAN 87	6100S/05225W	45X30 NM	NOAA-9
A-20B	28 JAN 87	6000S/03110W	15X22 NM	NOAA-9
A-22	21 JAN 87	7745S/04410W	45X43 NM	NOAA-9
A-23	21 JAN 87	7735S/04100W	59X39 NM	NOAA-9
A-24	21 JAN 87	7740S/03800W	45X43 NM	NOAA-9
C-2	28 JAN 87	7610S/02800W	08X15 NM	NOAA-9







NORTHERN ICE LIMIT 05 FEB 87

NAVY - NOAA JOINT ICE CENTER
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STAGE(S) OF DEVELOPMENT (THICKNESS)

- 1 = New ice (0 - 10 cm)
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- 7 = Old ice (survived at least one summer's melt)

EXAMPLES

$\frac{C}{C_1 C_2 C_3}$
 $\frac{S_1 S_2 S_3}{S_1 S_2 S_3}$

$\frac{C}{S_1}$
 $\frac{C}{S_2}$
 $\frac{C}{S_3}$

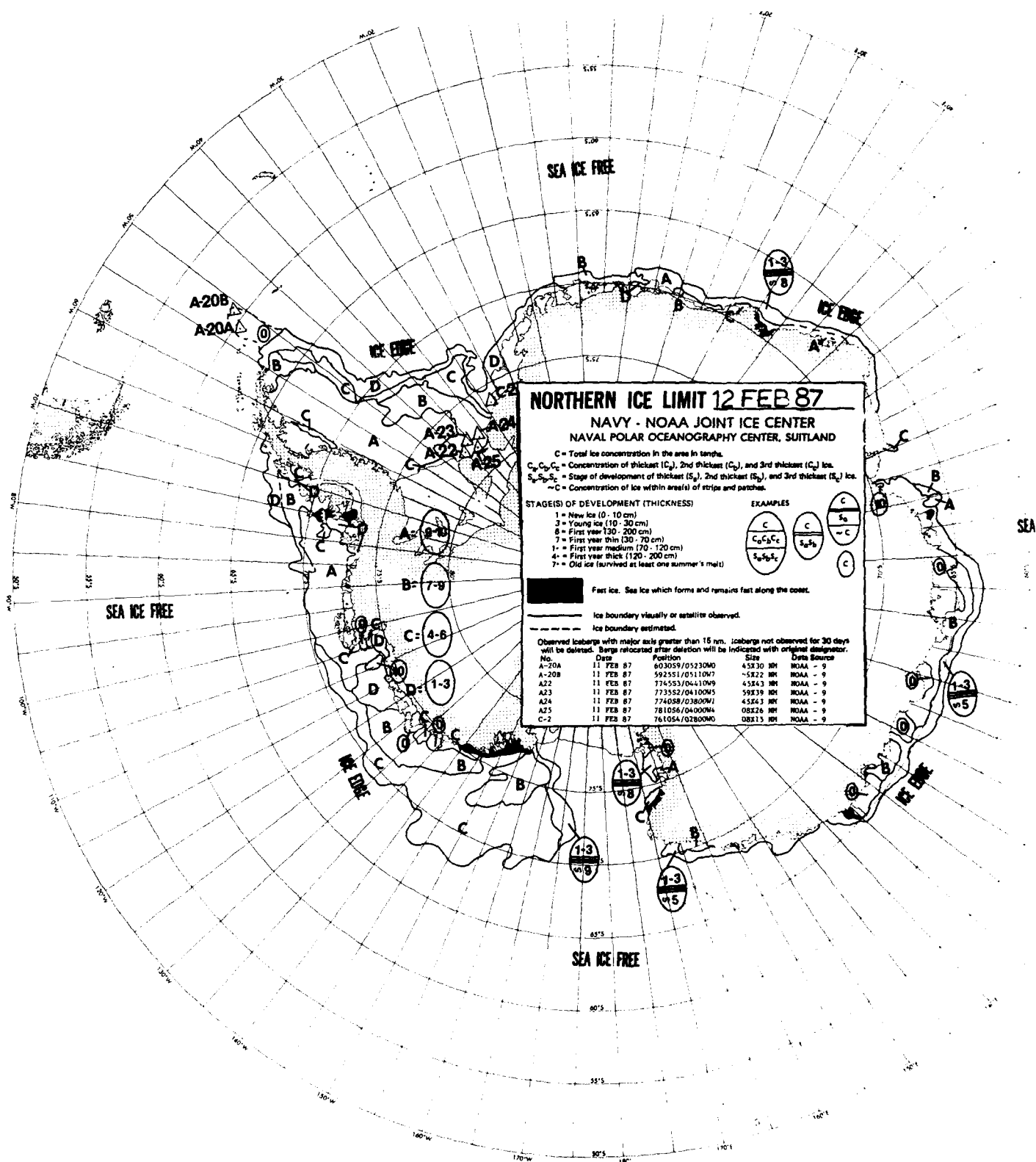
$\frac{C}{S_1}$
 $\frac{C}{S_2}$
 $\frac{C}{S_3}$

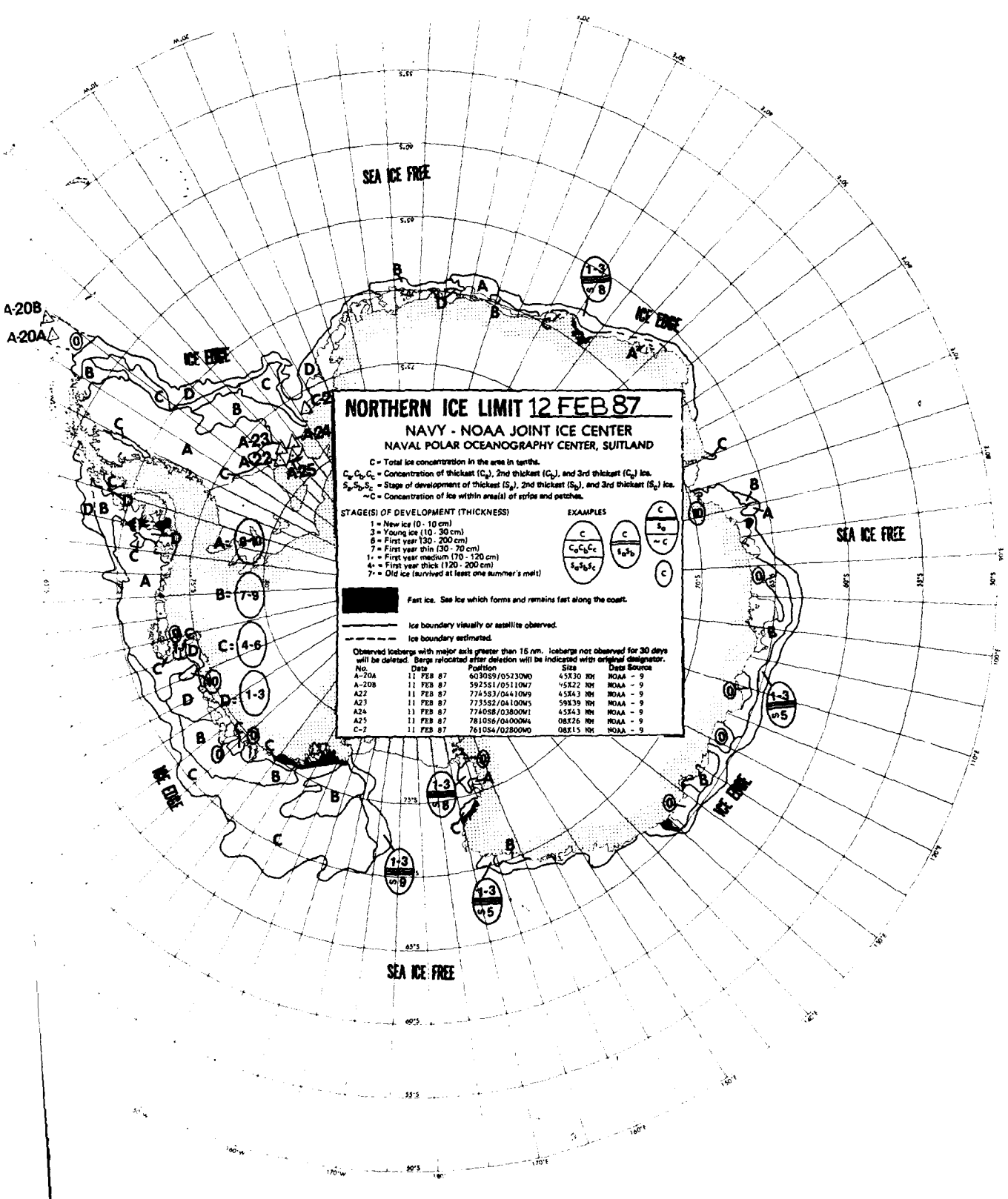
Legend:

- Fast ice. Sea ice which forms and remains fast along the coast.
- Ice boundary visually or satellite observed
- Ice boundary estimated.

Observed icebergs with major axis greater than 15 nm. Icebergs not observed for 30 days will be deleted. Berge relocated after deletion will be indicated with original designator.

No.	Date	Position	Size	Data Source
A-20A	04 FEB 87	603059/052300W	45X30 NM	NOAA - 9
A-20B	04 FEB 87	592551/051100W	45X22 NM	NOAA - 9
A22	04 FEB 87	774553/044100W	45X43 NM	NOAA - 9
A23	04 FEB 87	773552/041000W	59X35 NM	NOAA - 9
A24	04 FEB 87	774058/038000W	45X43 NM	NOAA - 9
A25	04 FEB 87	781056/040000W	08X26 NM	NOAA - 9
C-2	04 FEB 87	761054/028000W	08X15 NM	NOAA - 9





NORTHERN ICE LIMIT 12 FEB 87

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EXAMPLES

$\frac{C}{C_1 C_2 C_3}$

$\frac{C}{S_1 S_2 S_3}$

$\frac{C}{S_1}$

$\frac{C}{S_2}$

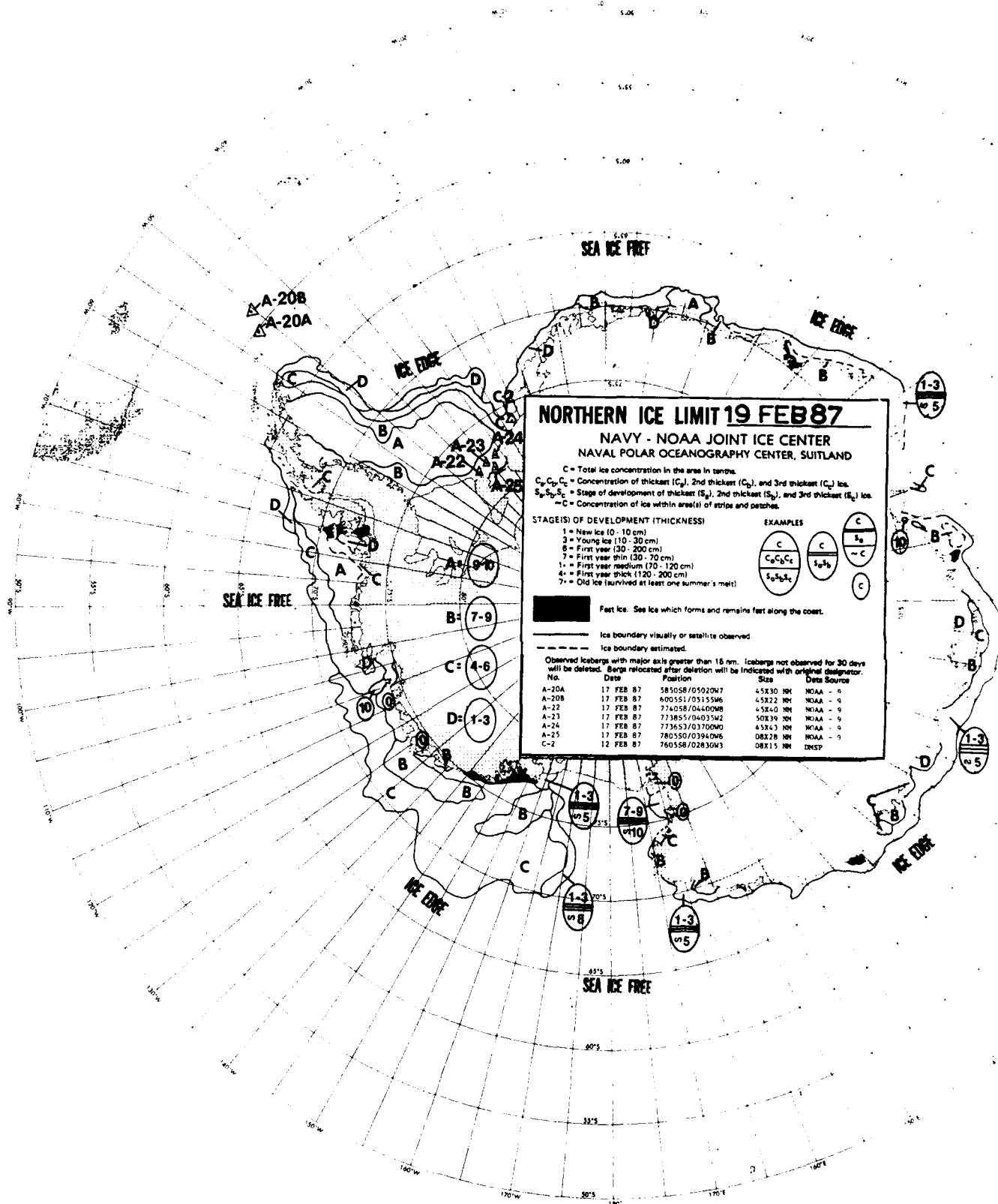
$\frac{C}{S_3}$

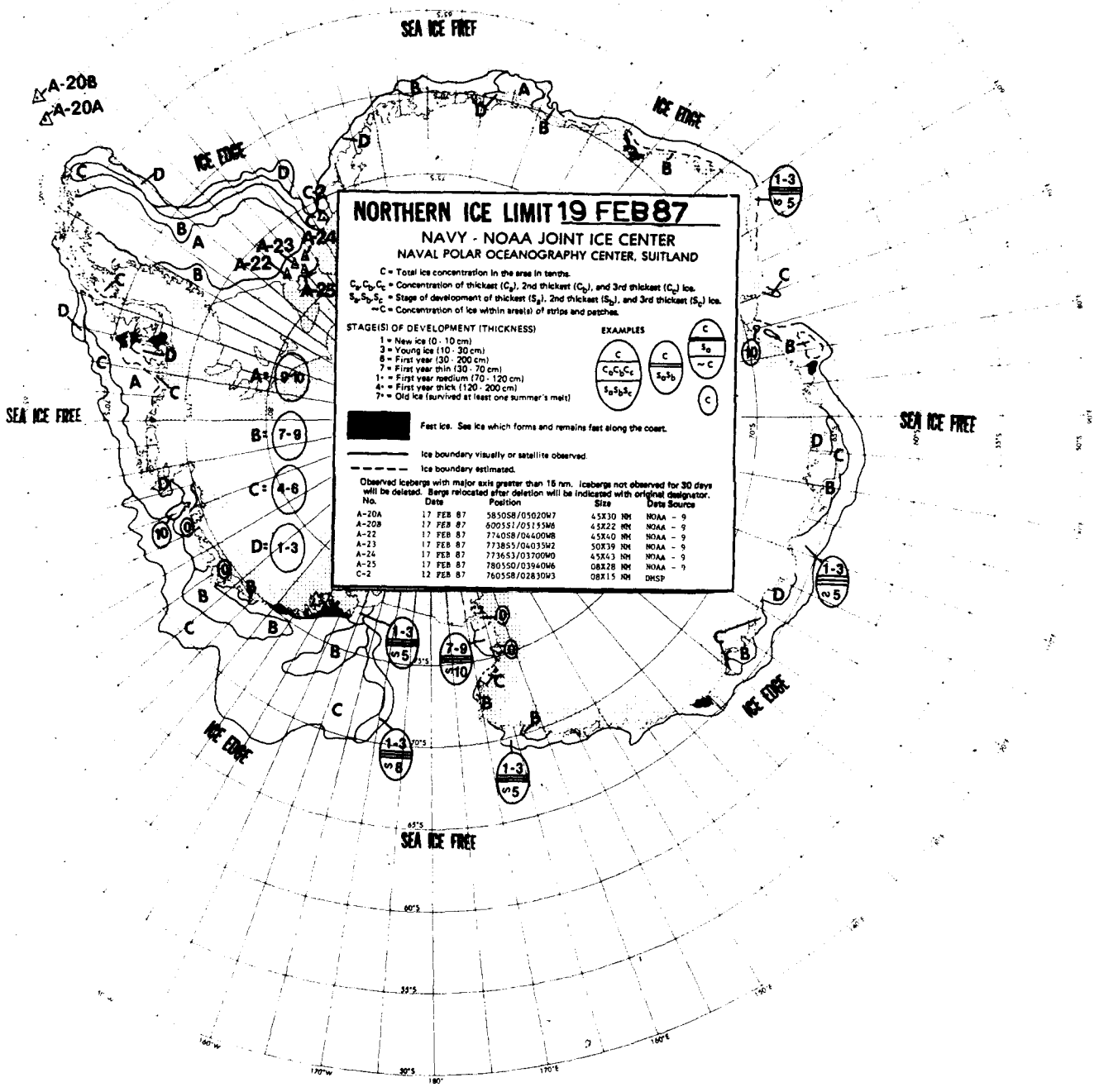
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Observed icebergs with major axis greater than 15 cm. Icebergs not observed for 30 days will be deleted. Berge relocated after deletion will be indicated with original designator.

No.	Date	Position	Size	Data Source
A-20A	11 FEB 87	603059/0523040	45330 NM	NOAA - 9
A-20B	11 FEB 87	592551/0511047	45822 NM	NOAA - 9
A-22	11 FEB 87	774553/0441049	45543 NM	NOAA - 9
A-23	11 FEB 87	773552/0410045	59839 NM	NOAA - 9
A-24	11 FEB 87	774058/0380041	45543 NM	NOAA - 9
A-25	11 FEB 87	781056/0400044	08826 NM	NOAA - 9
C-2	11 FEB 87	761054/0280040	08515 NM	NOAA - 9





NORTHERN ICE LIMIT 19 FEB 87

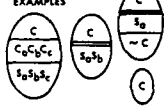
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NAVAL POLAR OCEANOGRAPHY CENTER, SUITLAND

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EXAMPLES

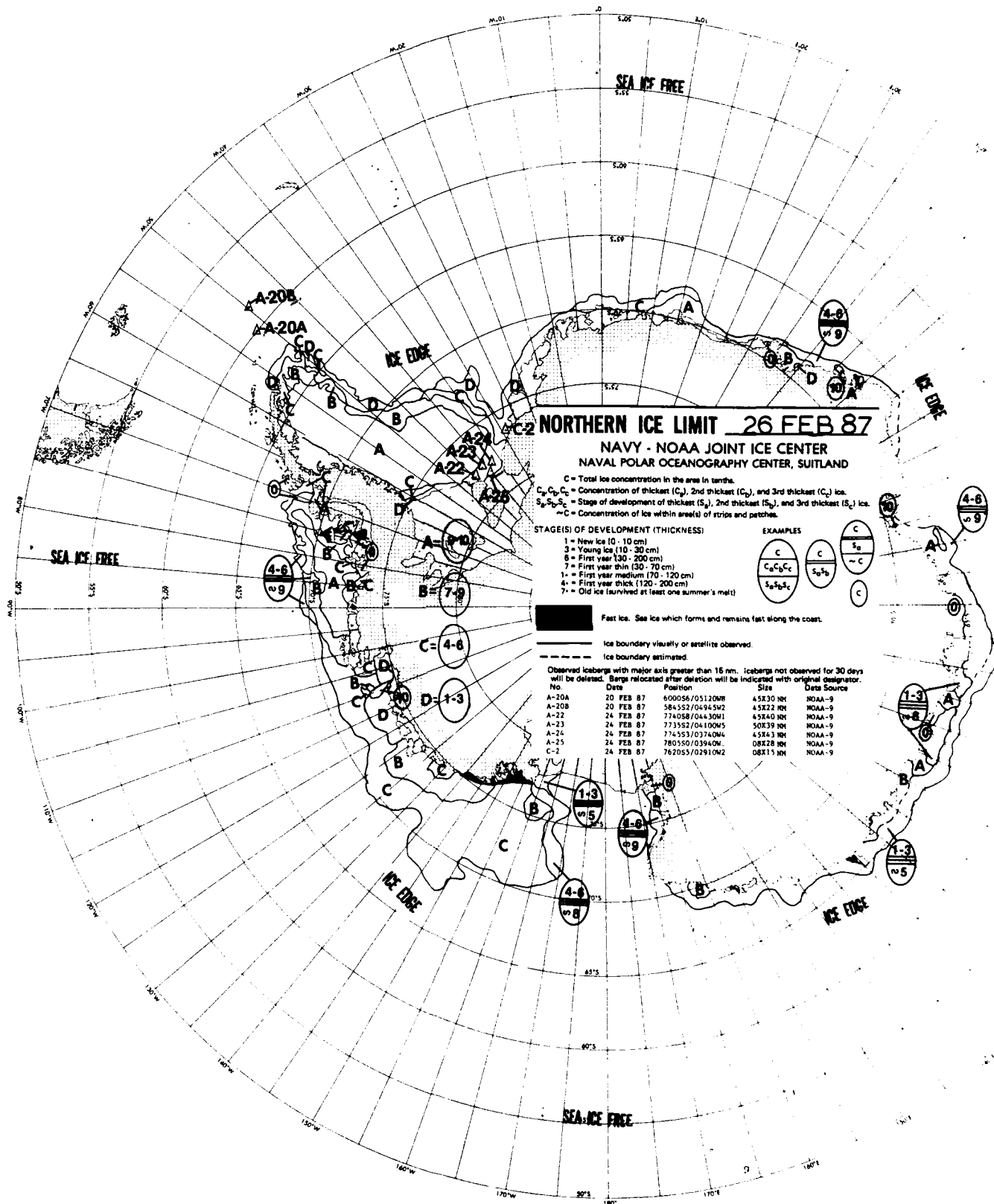


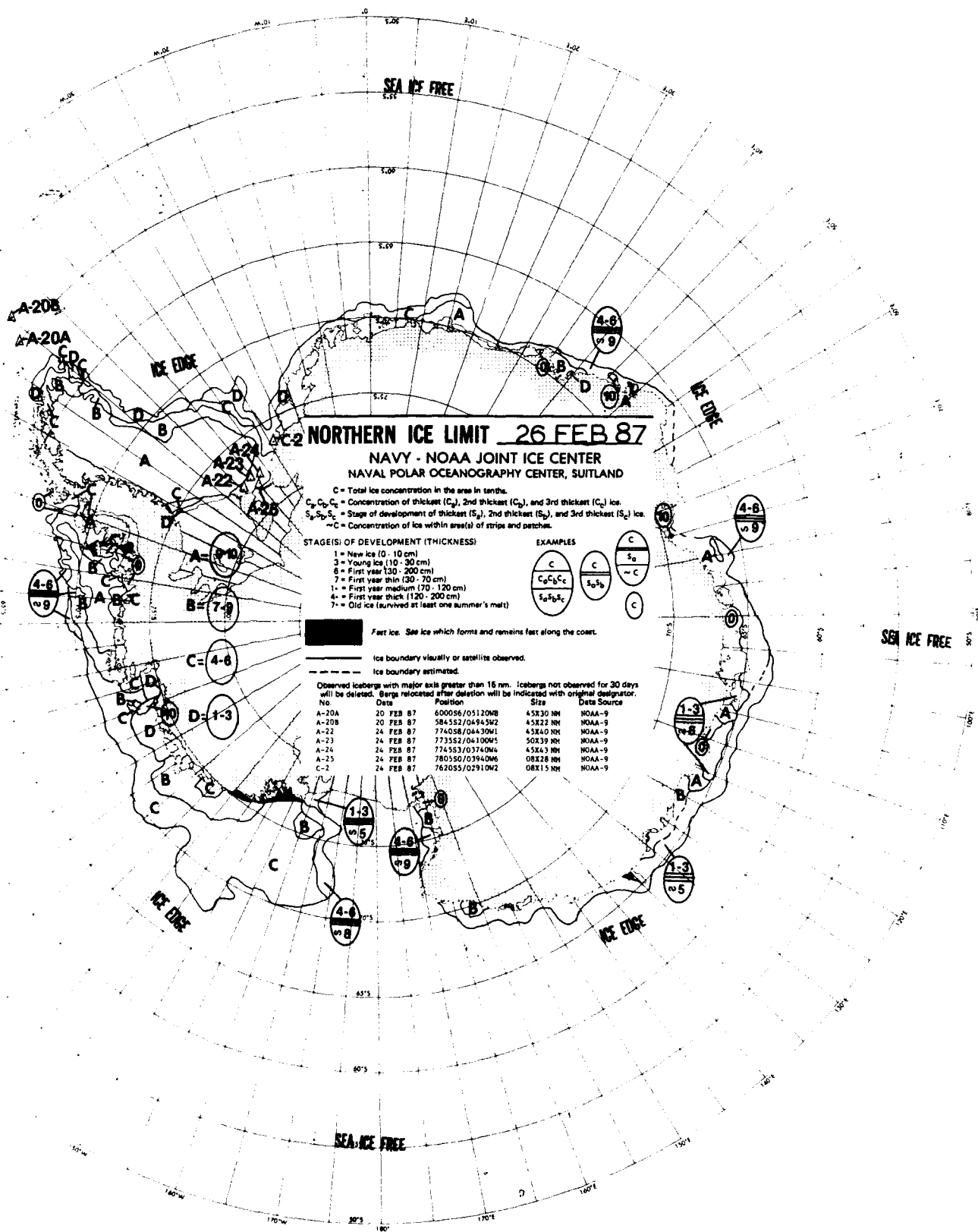
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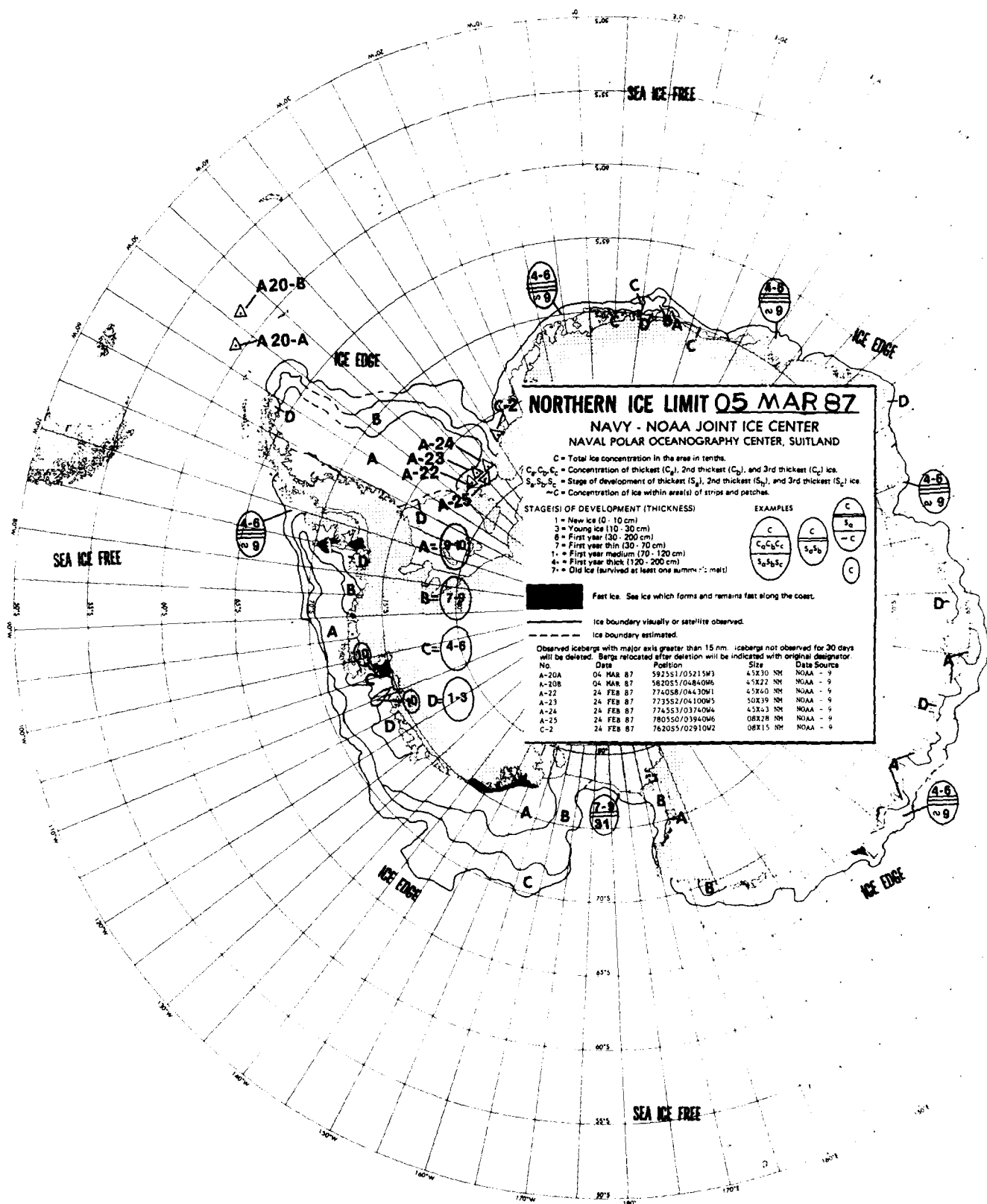
Ice boundary visually or satellite observed.
 Ice boundary estimated.

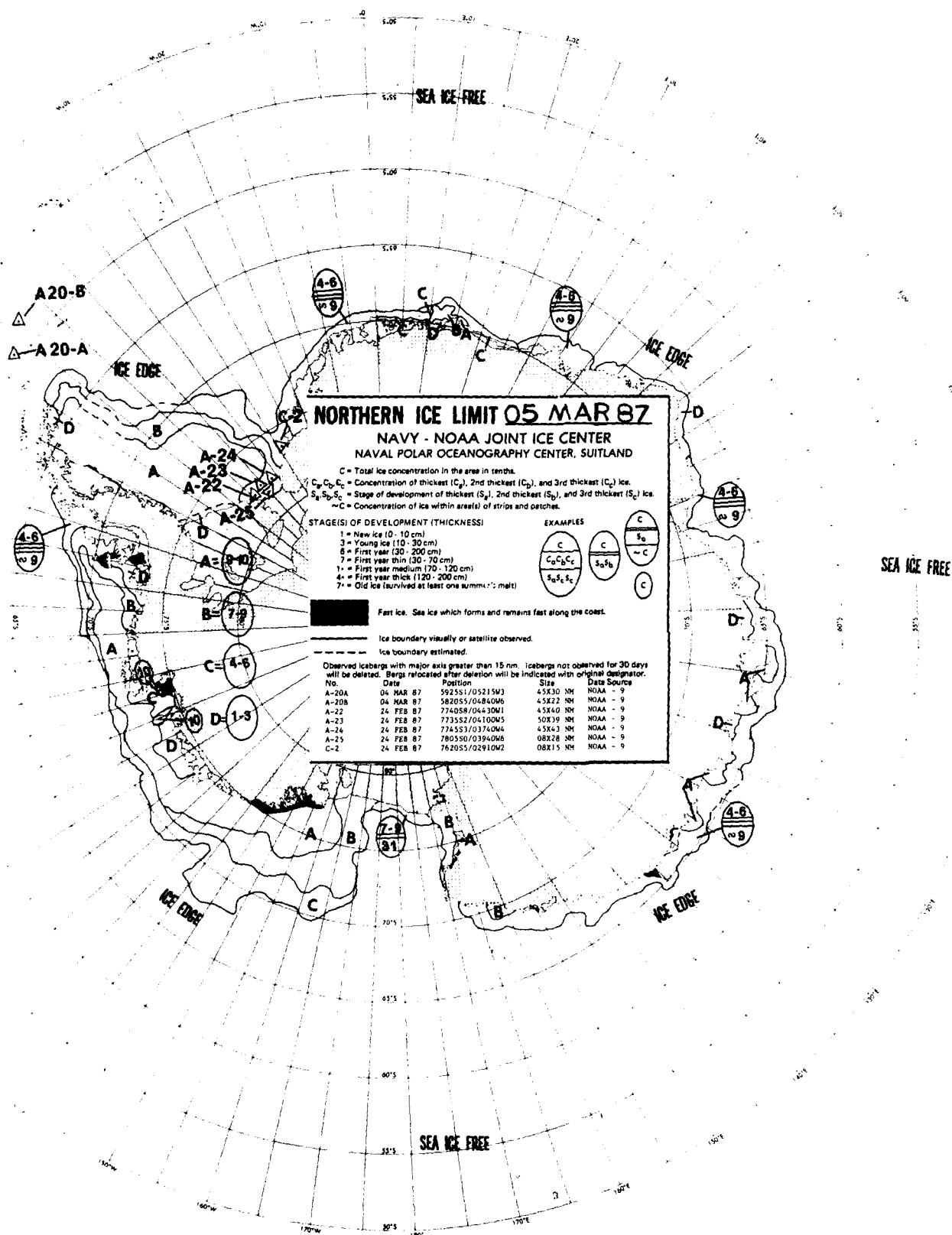
Observed icebergs with major axis greater than 15 nm. Icebergs not observed for 30 days will be deleted. Berge relocated after deletion will be indicated with original designator.

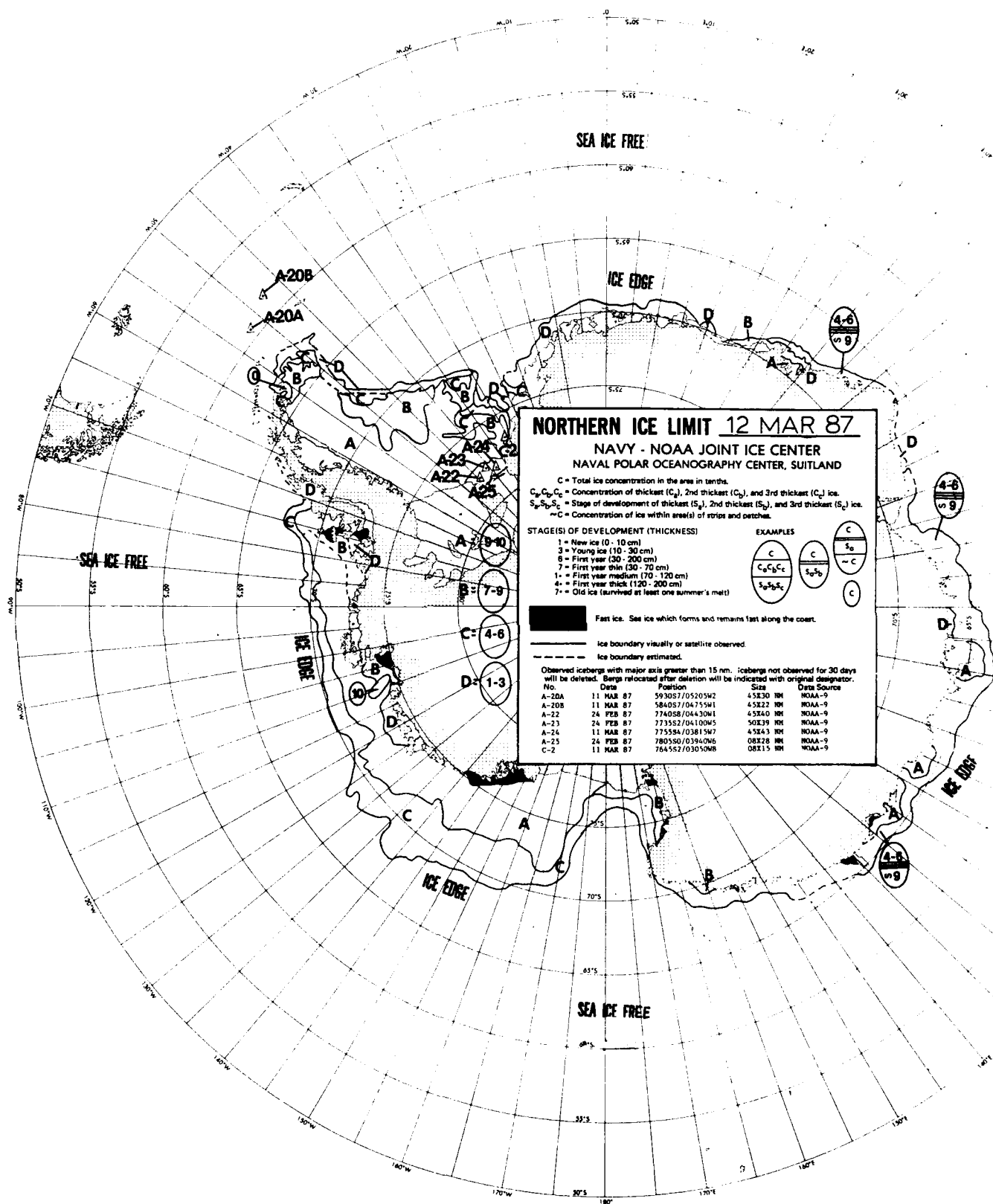
No.	Date	Position	Size	Data Source
A-20A	17 FEB 87	585058/05020W7	45X30 NM	NOAA - 9
A-20B	17 FEB 87	600551/05153W6	45X22 NM	NOAA - 9
A-22	17 FEB 87	774058/04400W8	45X40 NM	NOAA - 9
A-23	17 FEB 87	773855/04035W2	50X39 NM	NOAA - 9
A-24	17 FEB 87	773653/03700W0	45X43 NM	NOAA - 9
A-25	17 FEB 87	780550/03940W6	08X28 NM	NOAA - 9
C-2	12 FEB 87	760558/02830W3	08X15 NM	DMSP











SEA ICE FREE

ICE EDGE

NORTHERN ICE LIMIT 12 MAR 87

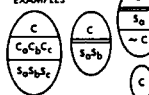
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NAVAL POLAR OCEANOGRAPHY CENTER, SUITLAND

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EXAMPLES



Fast ice. Sea ice which forms and remains fast along the coast.

Ice boundary visually or satellite observed.

Ice boundary estimated.

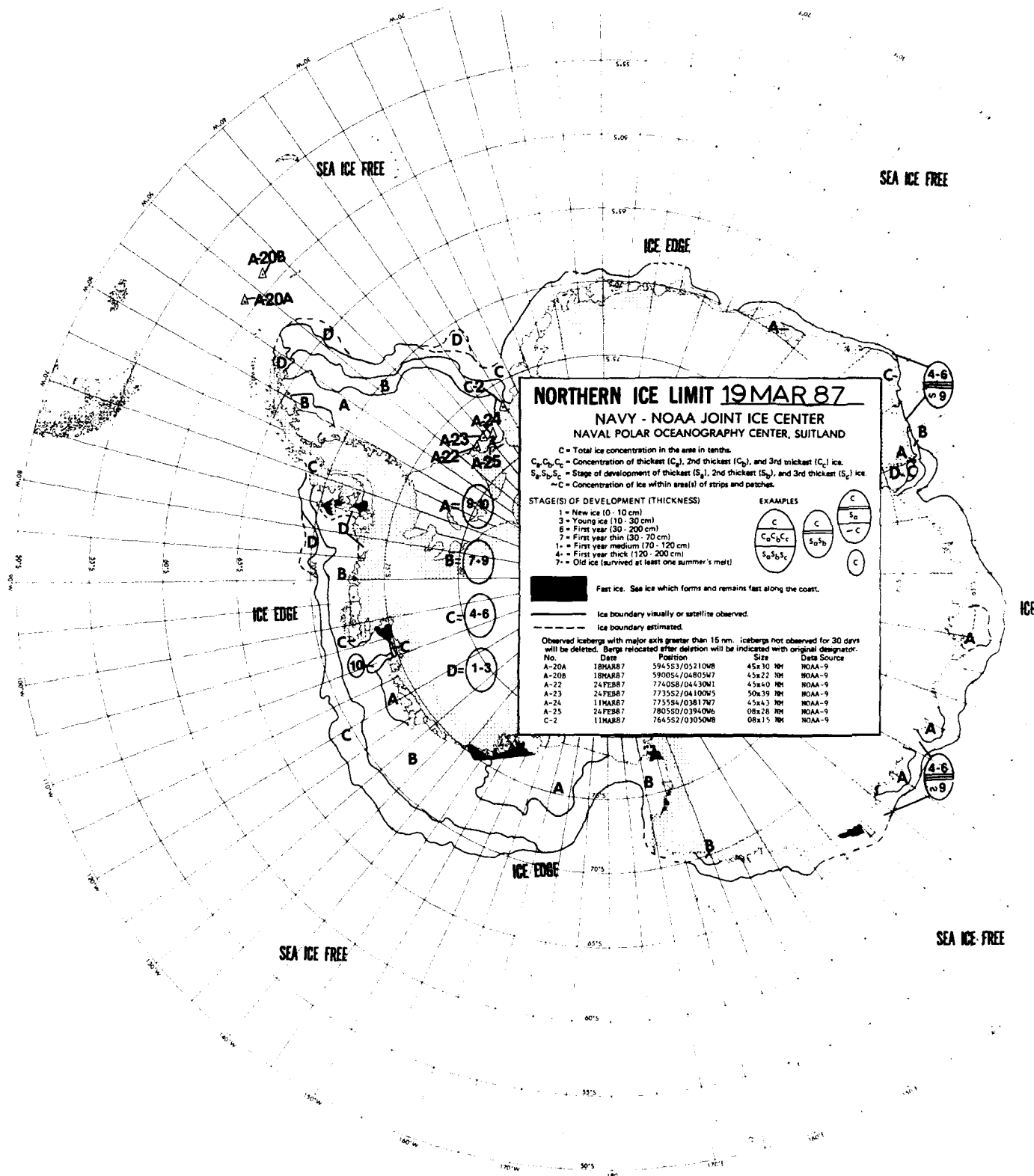
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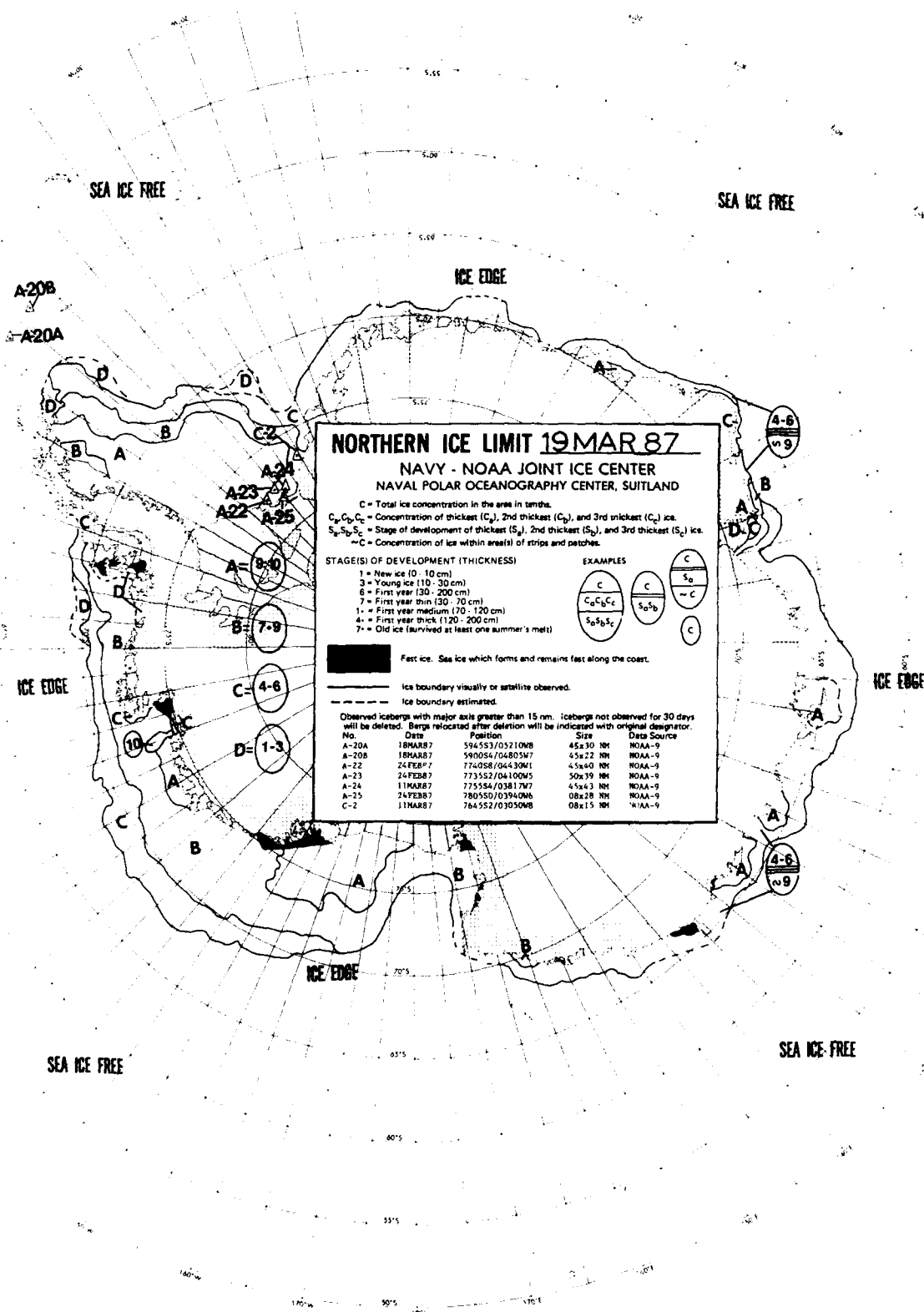
No.	Date	Position	Size	Data Source
A-20A	11 MAR 87	593057/05105W2	45X30 NM	NOAA-9
A-20B	11 MAR 87	584057/04755W1	45X22 NM	NOAA-9
A-22	24 FEB 87	774058/04430W1	45X40 NM	NOAA-9
A-23	24 FEB 87	773552/04100W5	50X39 NM	NOAA-9
A-24	11 MAR 87	775554/03815W7	45X43 NM	NOAA-9
A-25	24 FEB 87	780550/03940W6	08X28 NM	NOAA-9
C-2	11 MAR 87	764552/03050W8	08X15 NM	NOAA-9

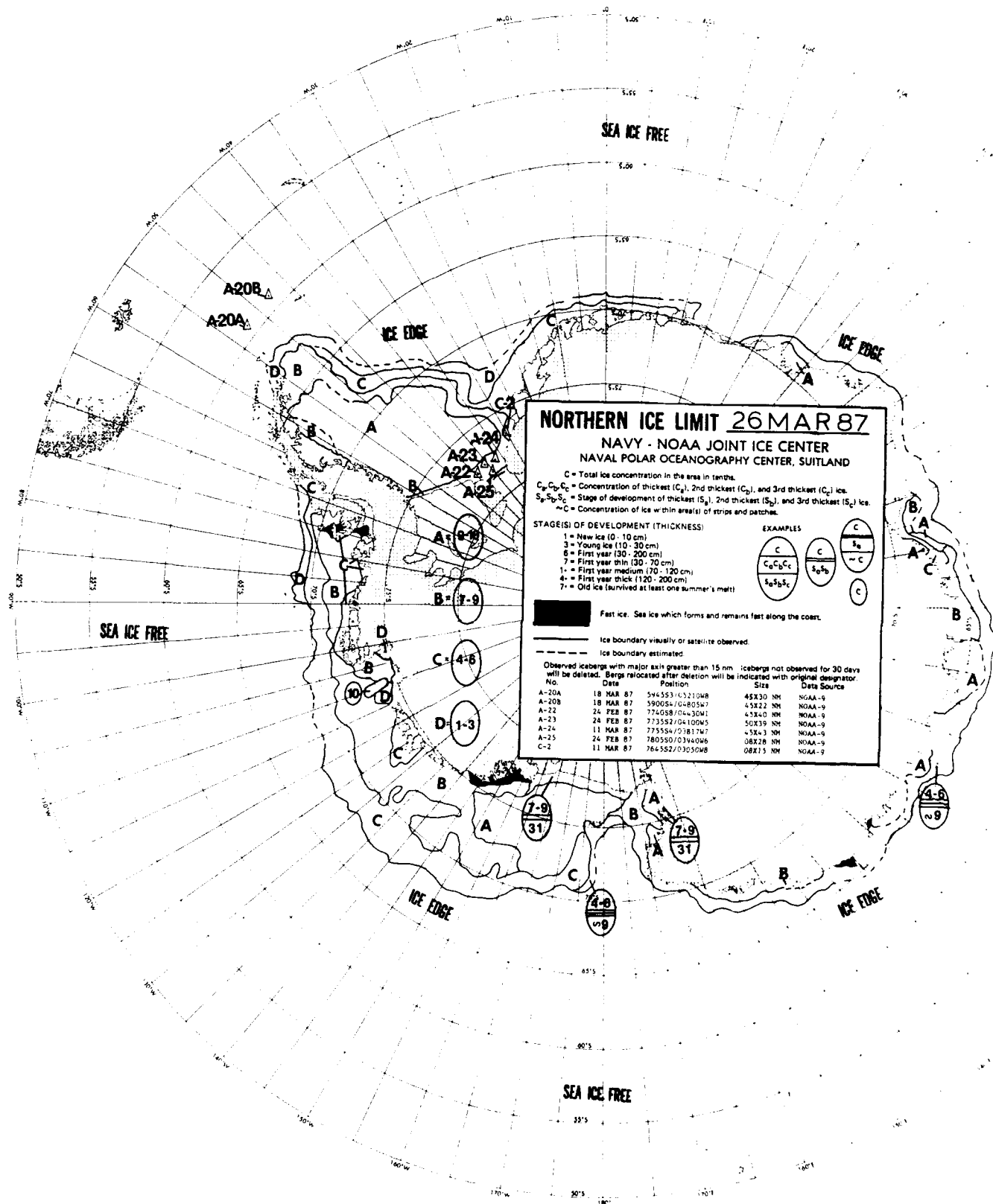
SEA ICE FREE

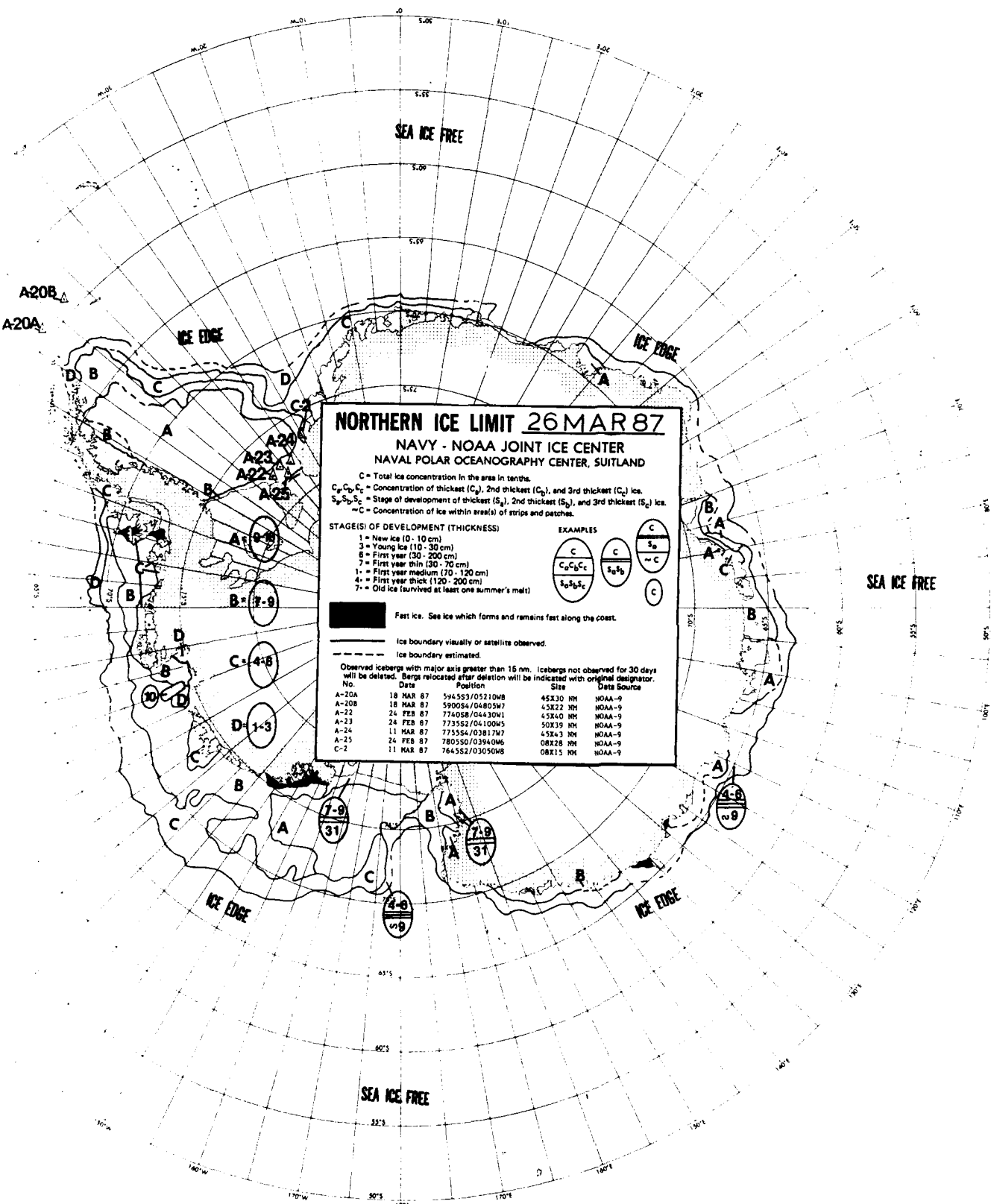
ICE EDGE

SEA ICE FREE







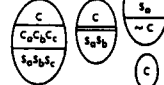


NORTHERN ICE LIMIT 26 MAR 87

NAVY - NOAA JOINT ICE CENTER
NAVAL POLAR OCEANOGRAPHY CENTER, SUITLAND

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EXAMPLES

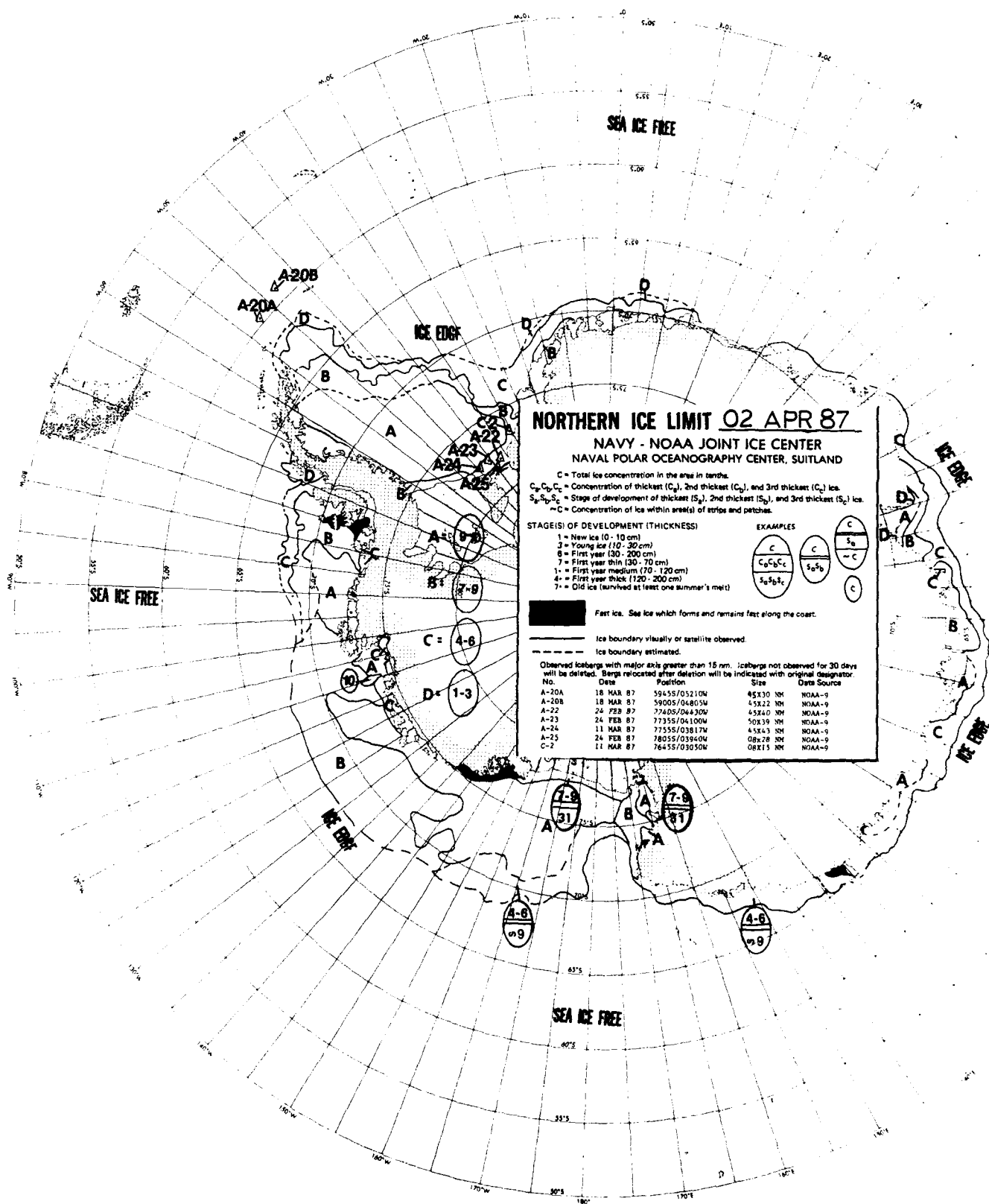


Fast ice. See ice which forms and remains fast along the coast.

— Ice boundary visually or satellite observed.
 --- Ice boundary estimated.

Observed icebergs with major axis greater than 15 nm. Icebergs not observed for 30 days will be deleted. Berge relocated after deletion will be indicated with original designator.

No.	Date	Position	Size	Data Source
A-20A	18 MAR 87	594553/052104B	45X30 NM	NOAA-9
A-20B	18 MAR 87	590054/04805W7	45X22 NM	NOAA-9
A-22	24 FEB 87	774058/04430W1	45X40 NM	NOAA-9
A-23	24 FEB 87	773552/04100W5	50X39 NM	NOAA-9
A-24	11 MAR 87	775554/03817W7	45X43 NM	NOAA-9
A-25	24 FEB 87	780550/03840W6	08X28 NM	NOAA-9
C-2	11 MAR 87	764552/03050W8	08X15 NM	NOAA-9



SEA ICE FREE

NORTHERN ICE LIMIT 02 APR 87

NAVY - NOAA JOINT ICE CENTER
NAVAL POLAR OCEANOGRAPHY CENTER, SUITLAND

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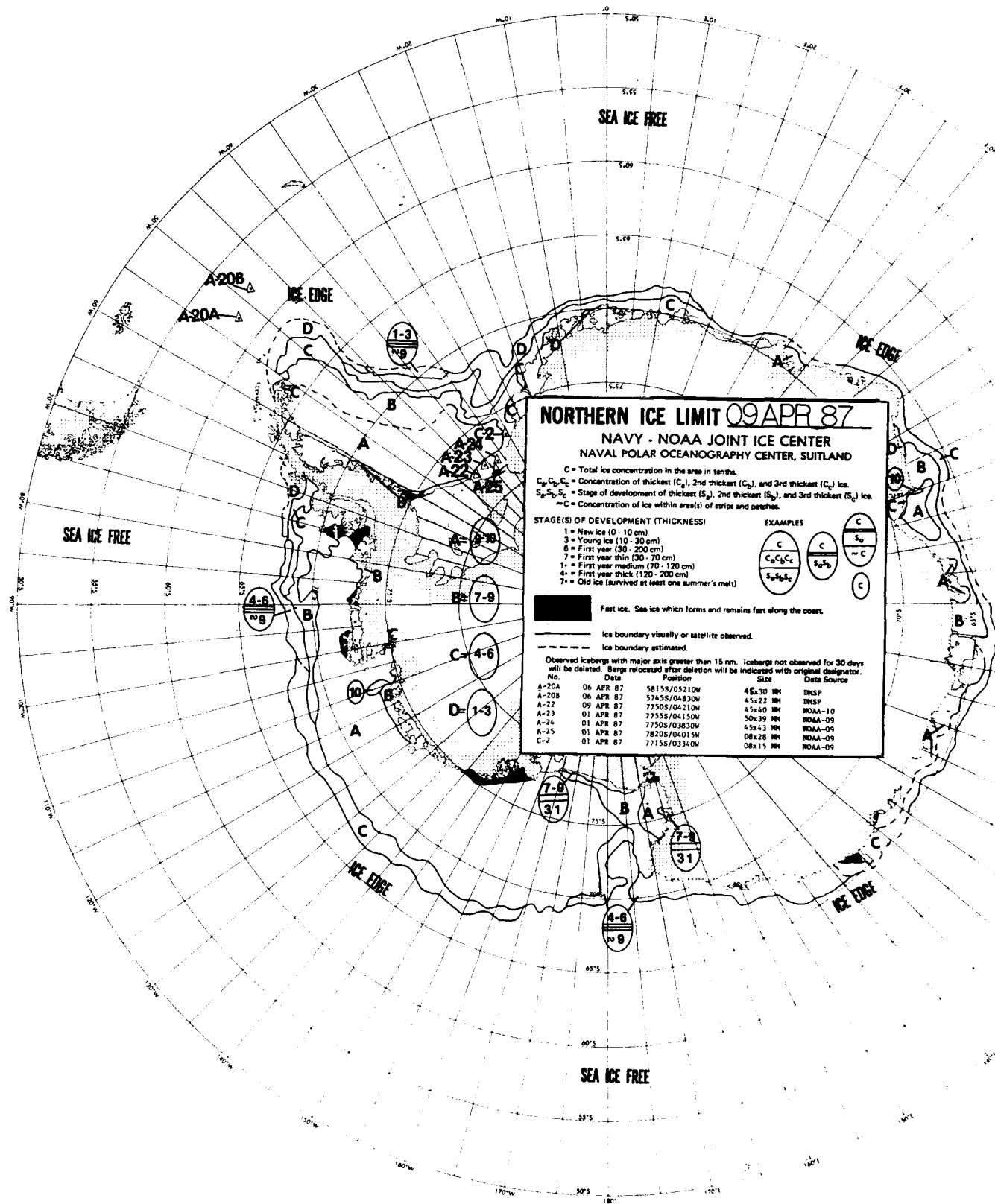
Ice boundary estimated.

Observed icebergs with major axis greater than 15 nm. Icebergs not observed for 30 days will be deleted. Berge relocated after deletion will be indicated with original designator.

No.	Date	Position	Size	Data Source
A-20A	18 MAR 87	59435/05210W	45X30 NM	NOAA-9
A-20B	18 MAR 87	59005/04805W	45X22 NM	NOAA-9
A-22	24 FEB 87	77405/04430W	45X40 NM	NOAA-9
A-23	24 FEB 87	77355/04100W	50X30 NM	NOAA-9
A-24	11 MAR 87	77535/03817W	45X43 NM	NOAA-9
A-25	24 FEB 87	18035/03940W	08X28 NM	NOAA-9
C-2	11 MAR 87	76455/03050W	08X15 NM	NOAA-9

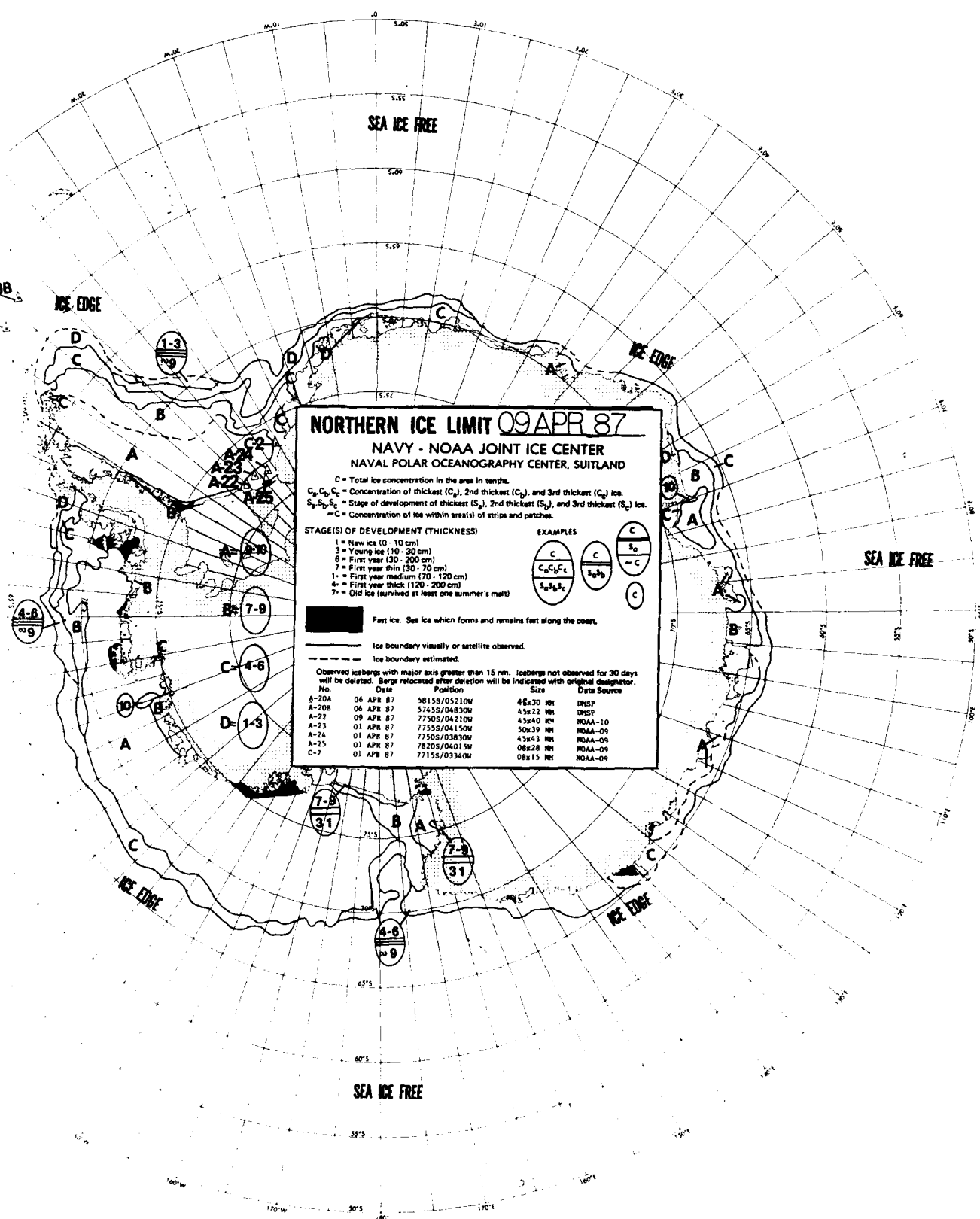
SEA ICE FREE

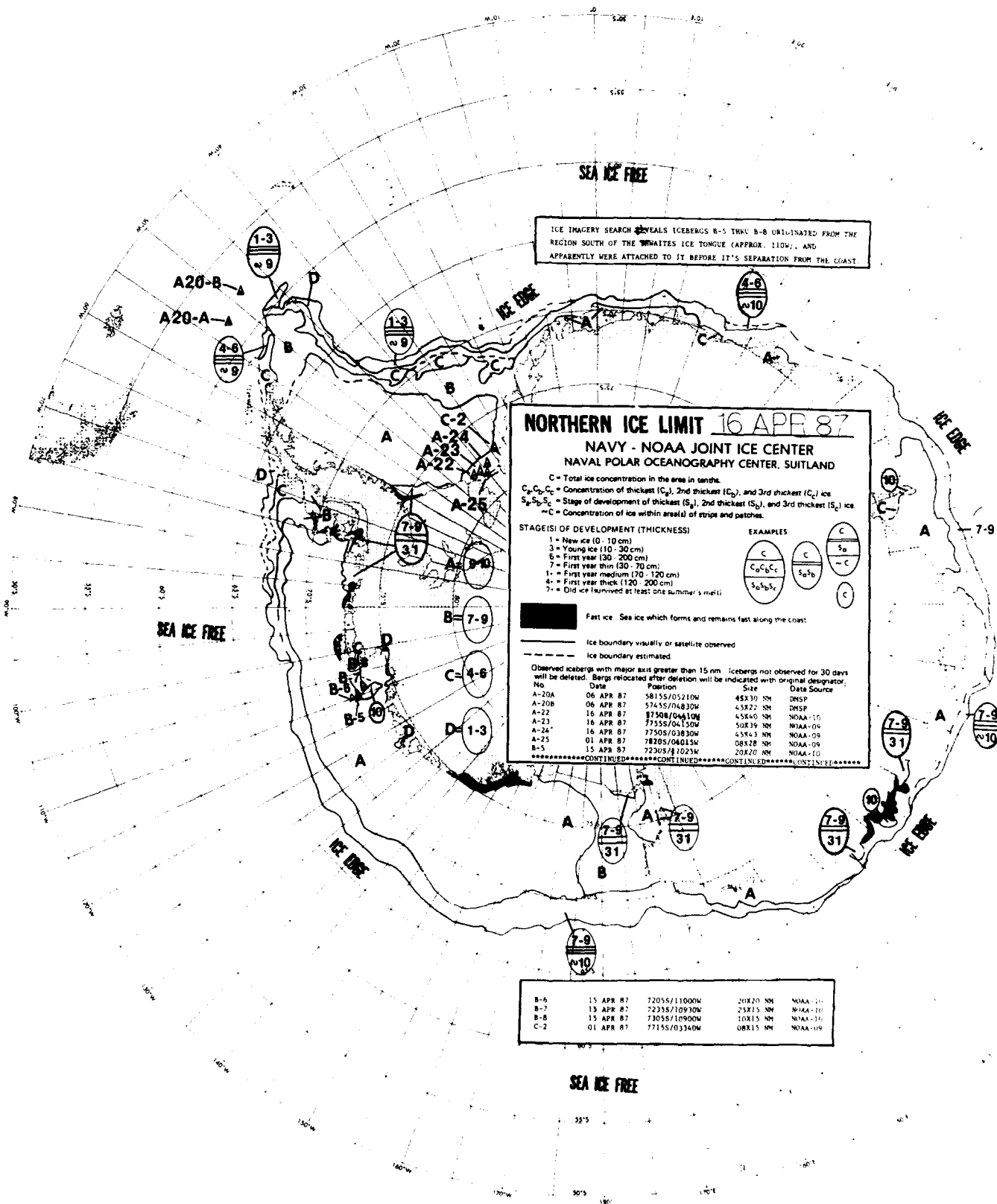
SEA ICE FREE

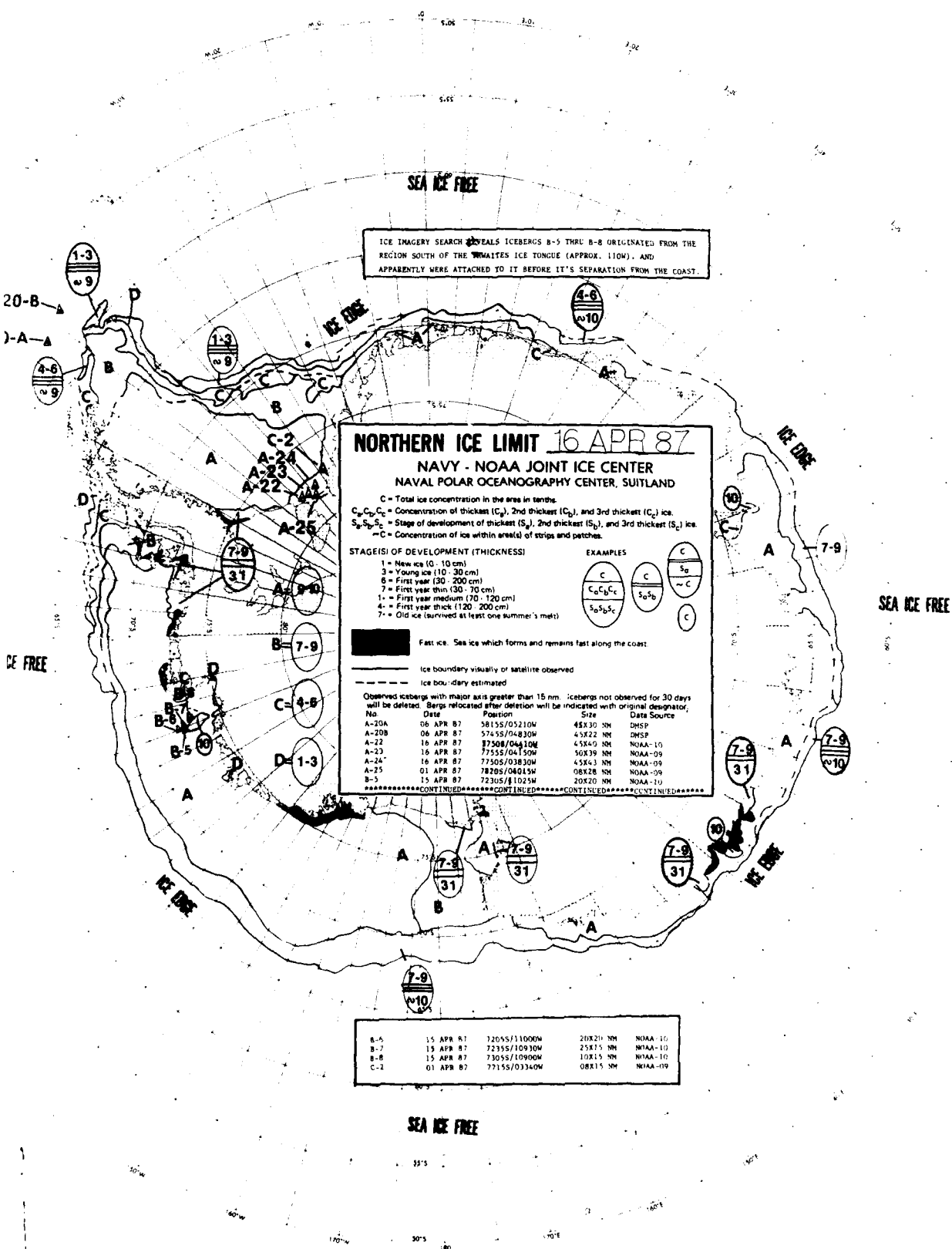


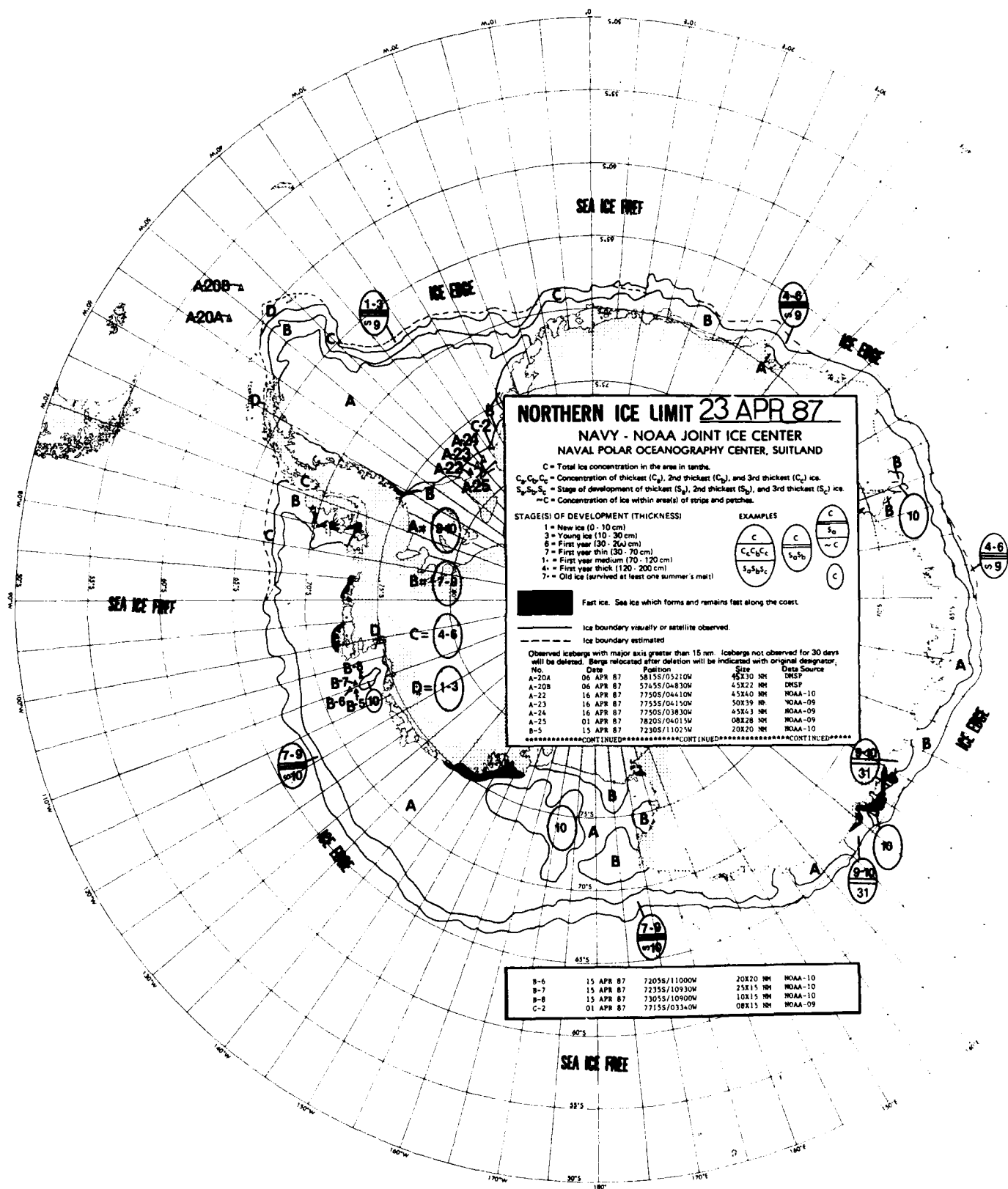
A-20B

JA









A20B
A20A

SEA ICE FREE

NORTHERN ICE LIMIT 23 APR 87

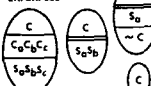
NAVY - NOAA JOINT ICE CENTER
NAVAL POLAR OCEANOGRAPHY CENTER, SUITLAND

C = Total ice concentration in the area in tenths.
C₁C₂C₃ = Concentration of thickest (C₁), 2nd thickest (C₂), and 3rd thickest (C₃) ice.
S₁S₂S₃ = Stage of development of thickest (S₁), 2nd thickest (S₂), and 3rd thickest (S₃) ice.
~C = Concentration of ice within area(s) of stripes and patches.

STAGE(S) OF DEVELOPMENT (THICKNESS)

- 1 = New ice (0 - 10 cm)
- 3 = Young ice (10 - 30 cm)
- 6 = First year thin (30 - 200 cm)
- 7 = First year thin (30 - 70 cm)
- 1 = First year medium (70 - 120 cm)
- 4 = First year thick (120 - 200 cm)
- 7 = Old ice (survived at least one summer's melt)

EXAMPLES



Fast ice. See ice which forms and remains fast along the coast.

Ice boundary visually or satellite observed.

Ice boundary estimated.

Observed icebergs with major axis greater than 15 nm. Icebergs not observed for 30 days will be deleted. Berge relocated after deletion will be indicated with original designator.

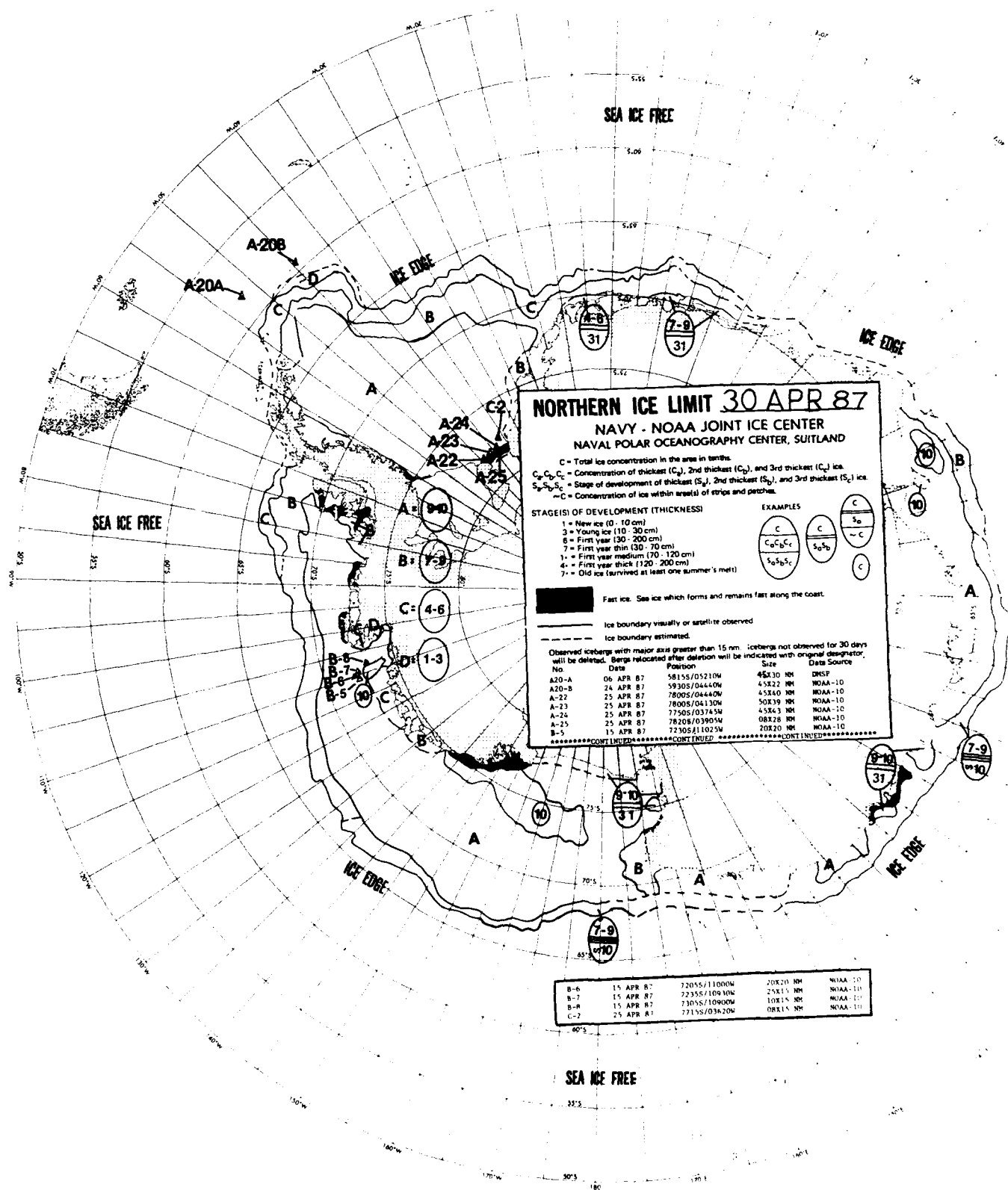
No.	Date	Position	Size	Data Source
A-20A	06 APR 87	5815S/05210W	45X30 NM	DMSP
A-20B	06 APR 87	5745S/04830W	45X22 NM	DMSP
A-22	16 APR 87	7750S/04410W	45X40 NM	NOAA-10
A-23	16 APR 87	7755S/04150W	50X30 NM	NOAA-09
A-24	16 APR 87	7750S/03830W	45X43 NM	NOAA-09
A-25	01 APR 87	7820S/04015W	48X28 NM	NOAA-09
B-5	15 APR 87	7230S/11025W	20X20 NM	NOAA-10

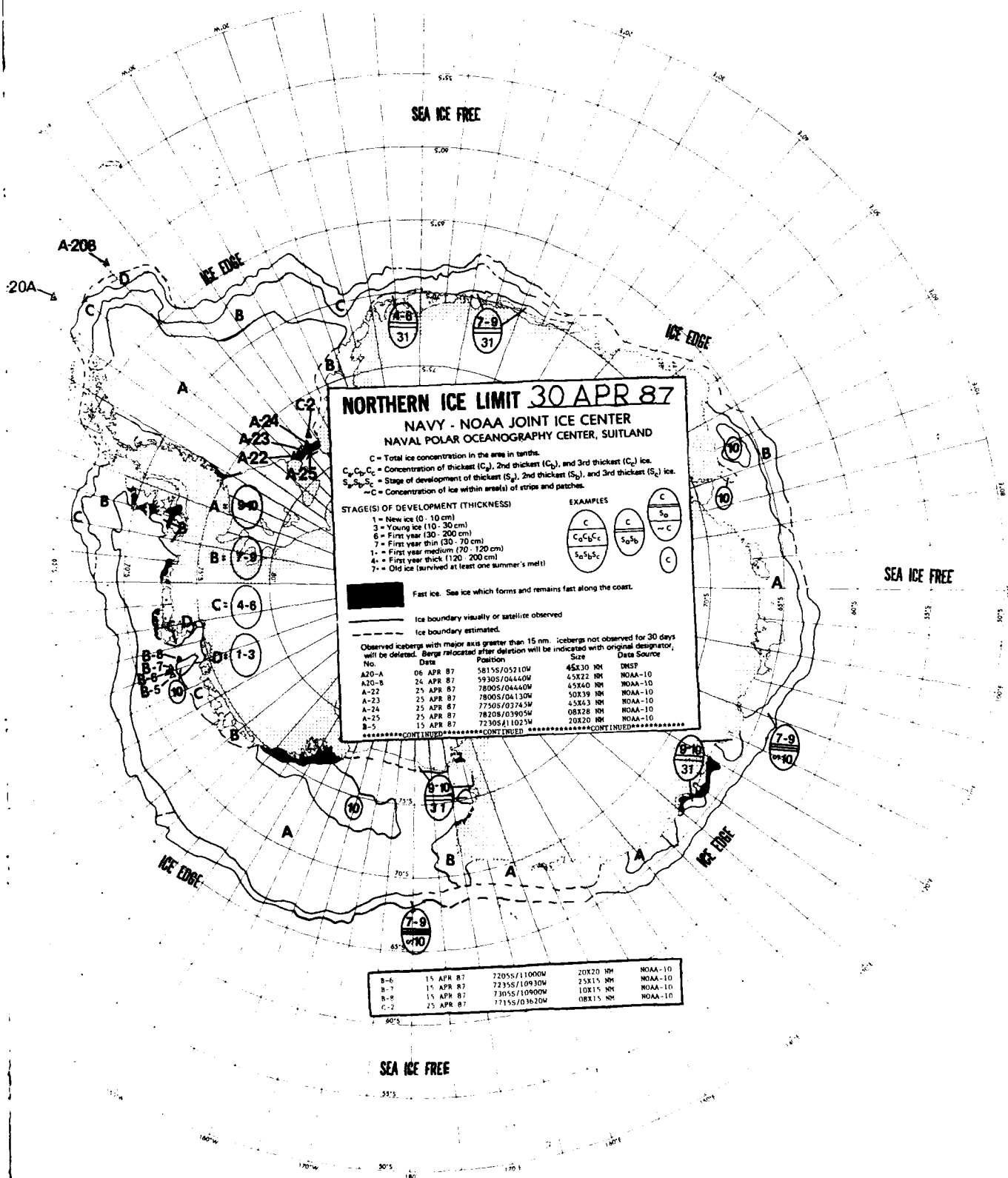
*****CONTINUED*****CONTINUED*****CONTINUED*****

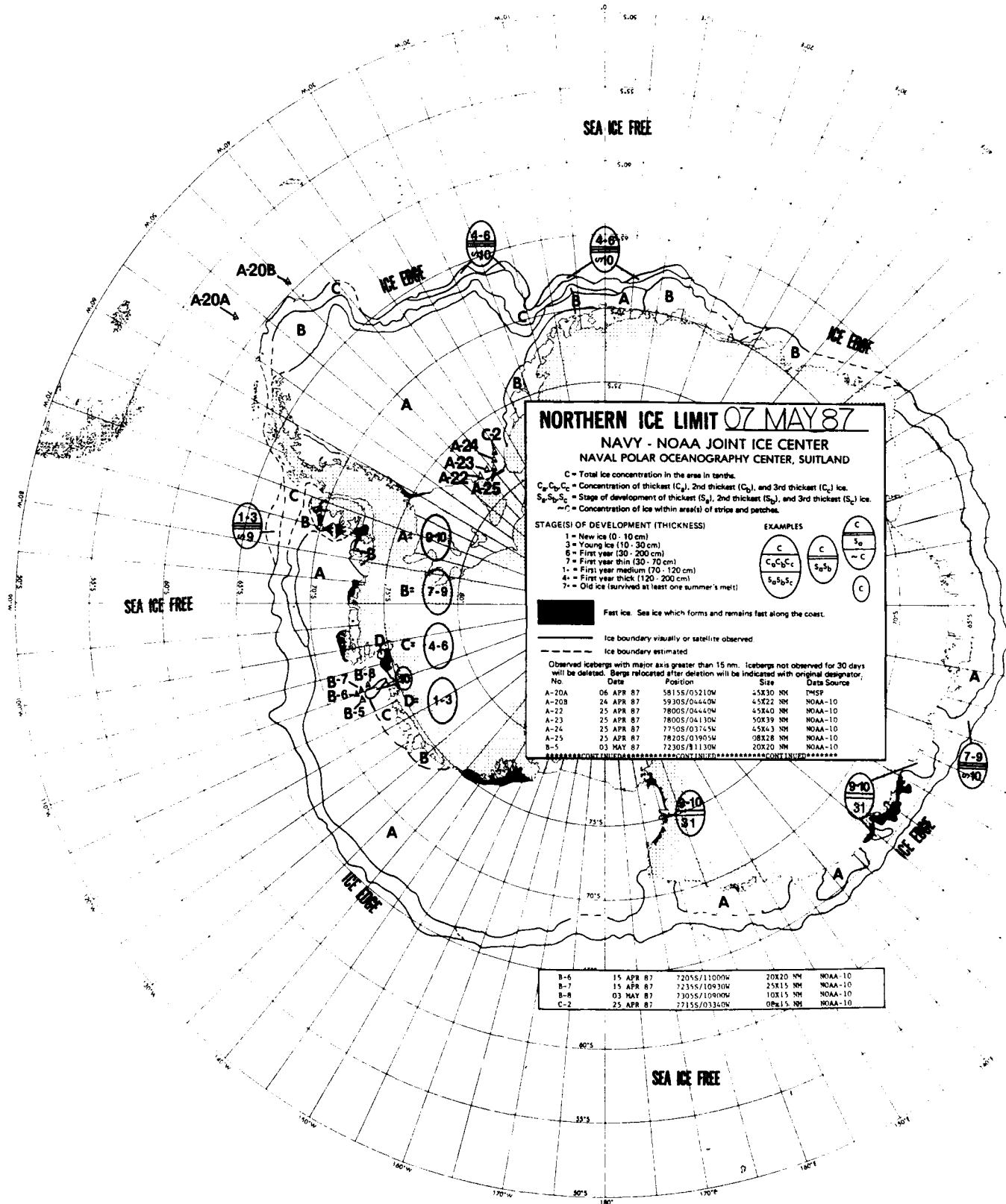
B-6	15 APR 87	7205S/11000W	20X20 NM	NOAA-10
B-7	15 APR 87	7235S/10930W	25X15 NM	NOAA-10
B-8	15 APR 87	7305S/10900W	10X15 NM	NOAA-10
C-2	01 APR 87	5715S/03340W	08X15 NM	NOAA-09

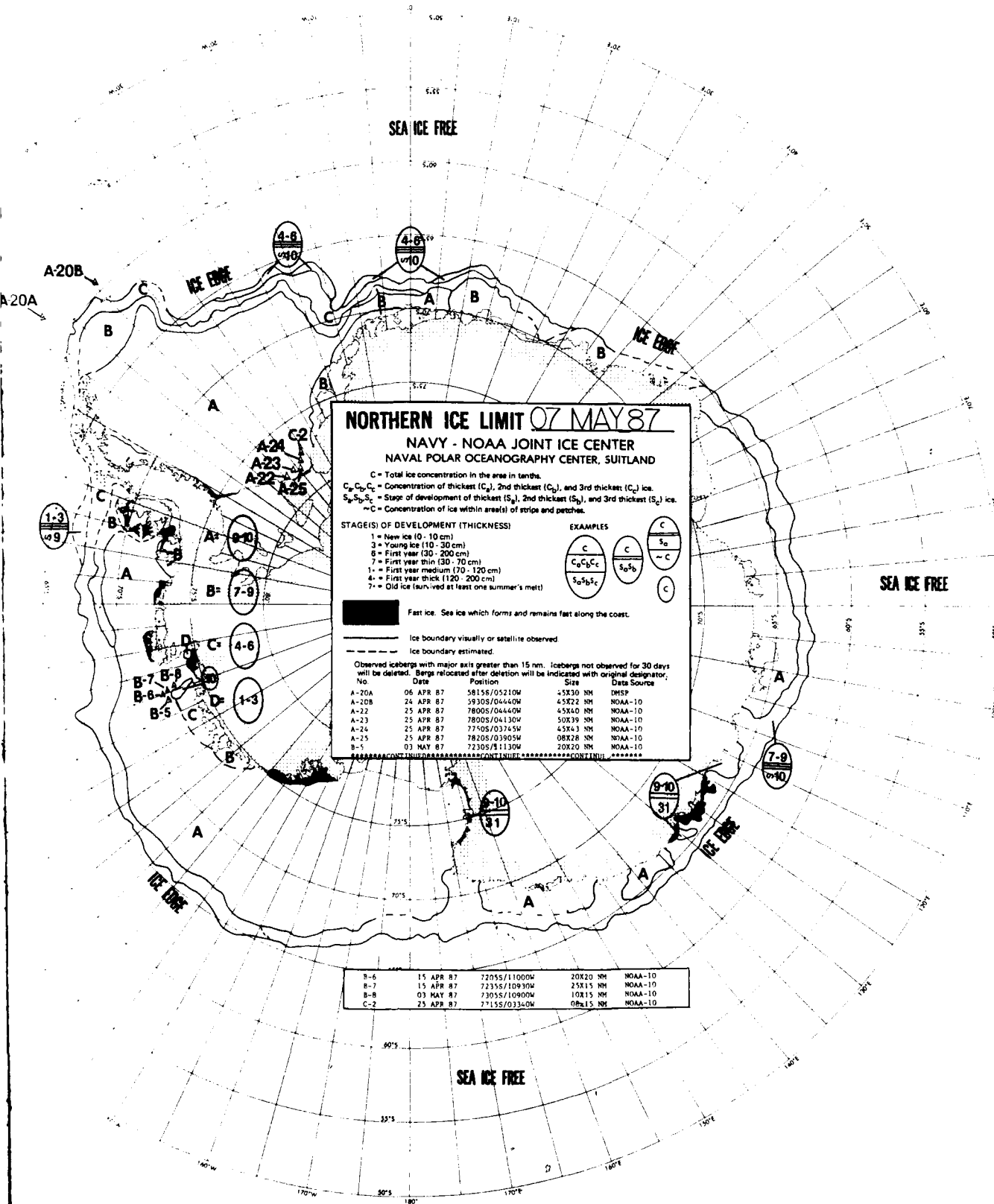
SEA ICE FREE

SEA ICE FREE

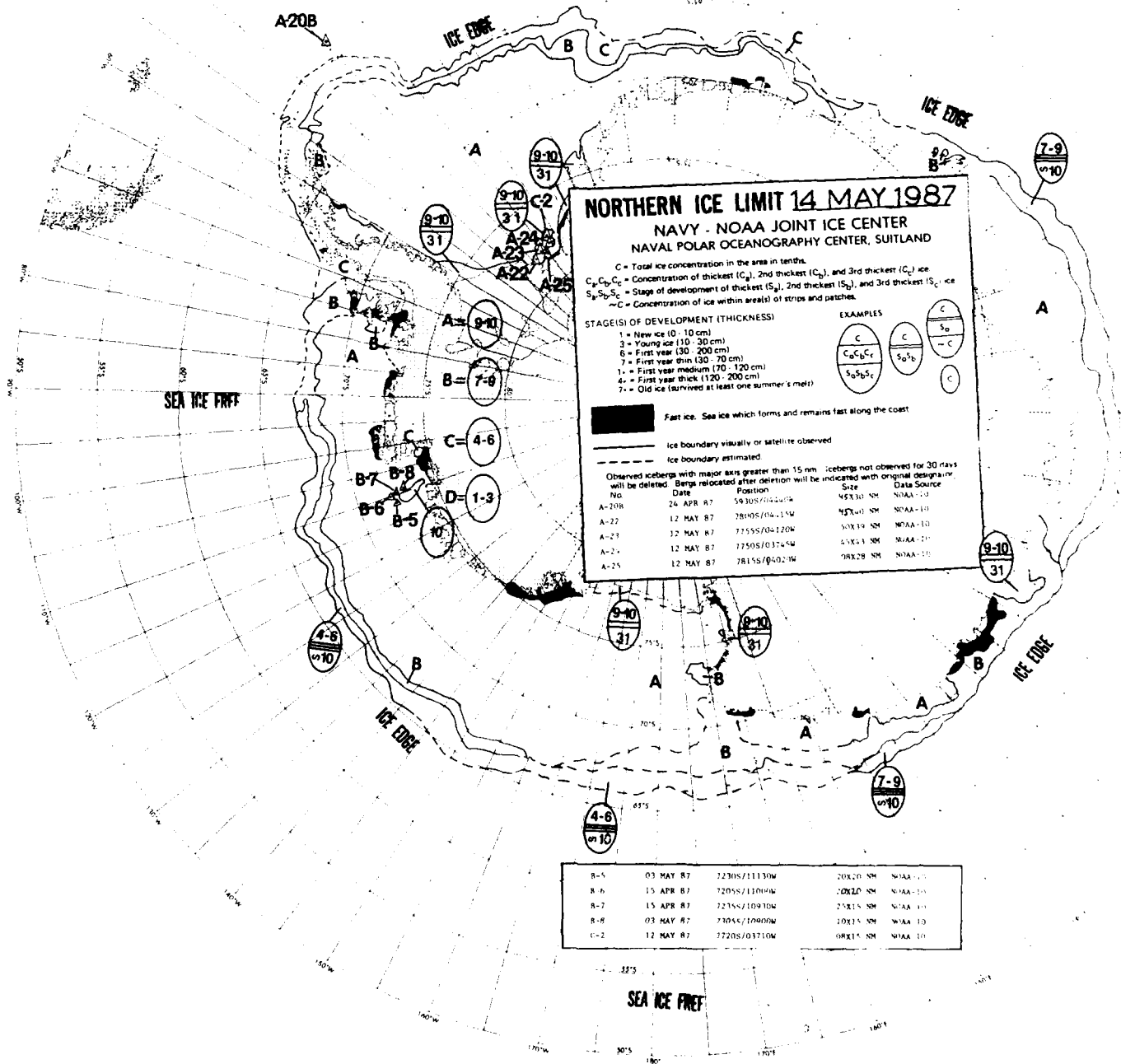




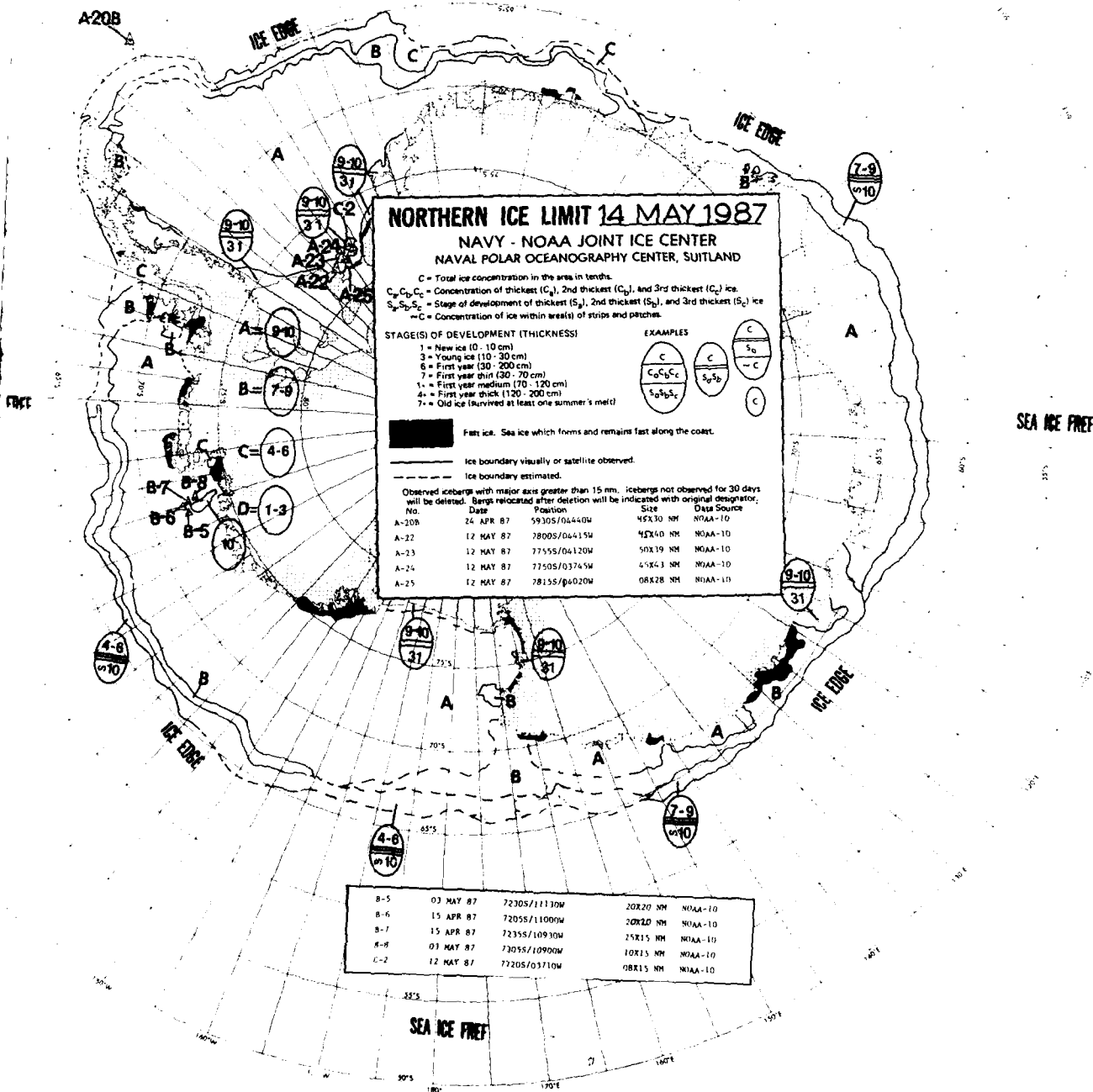


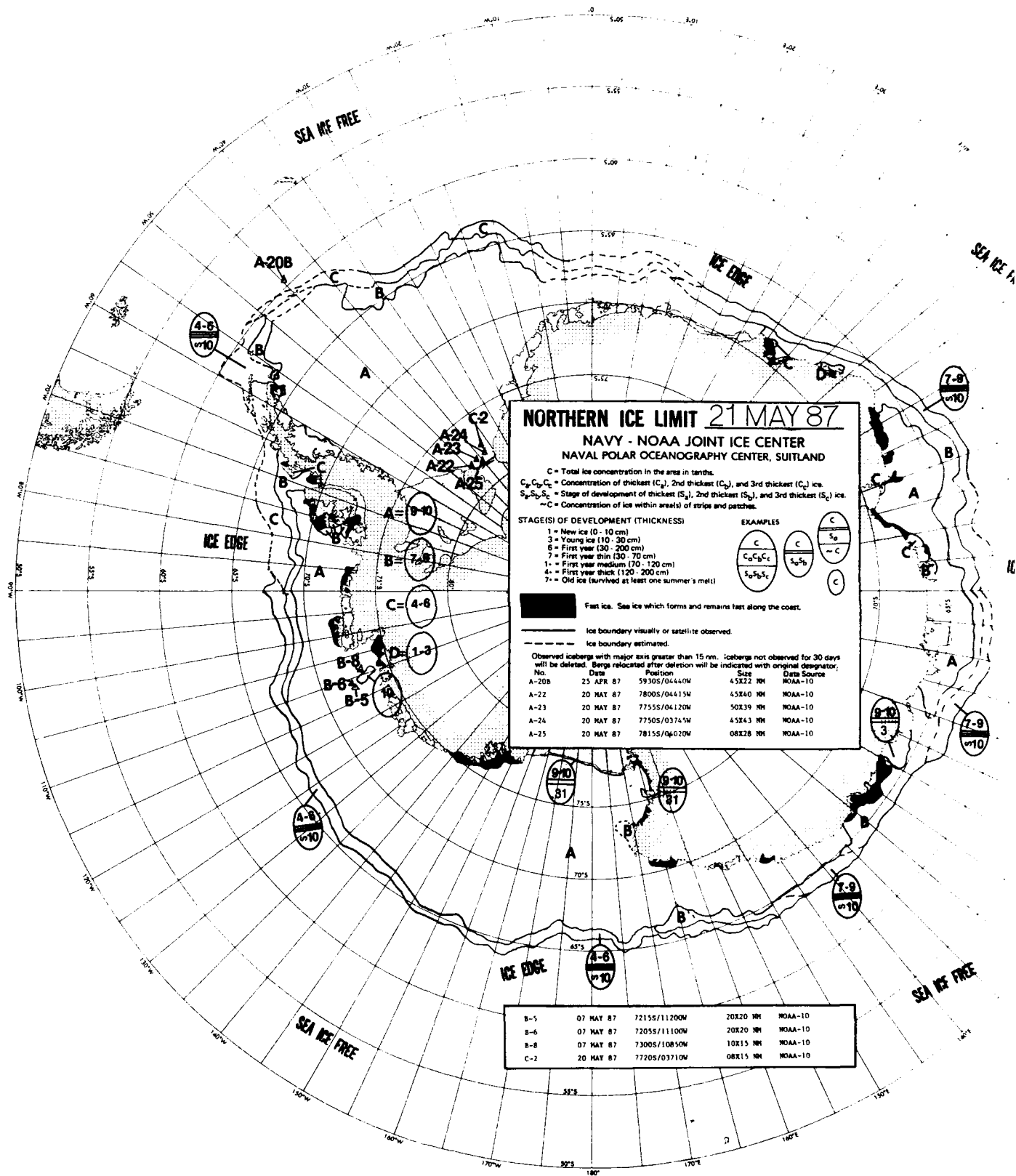


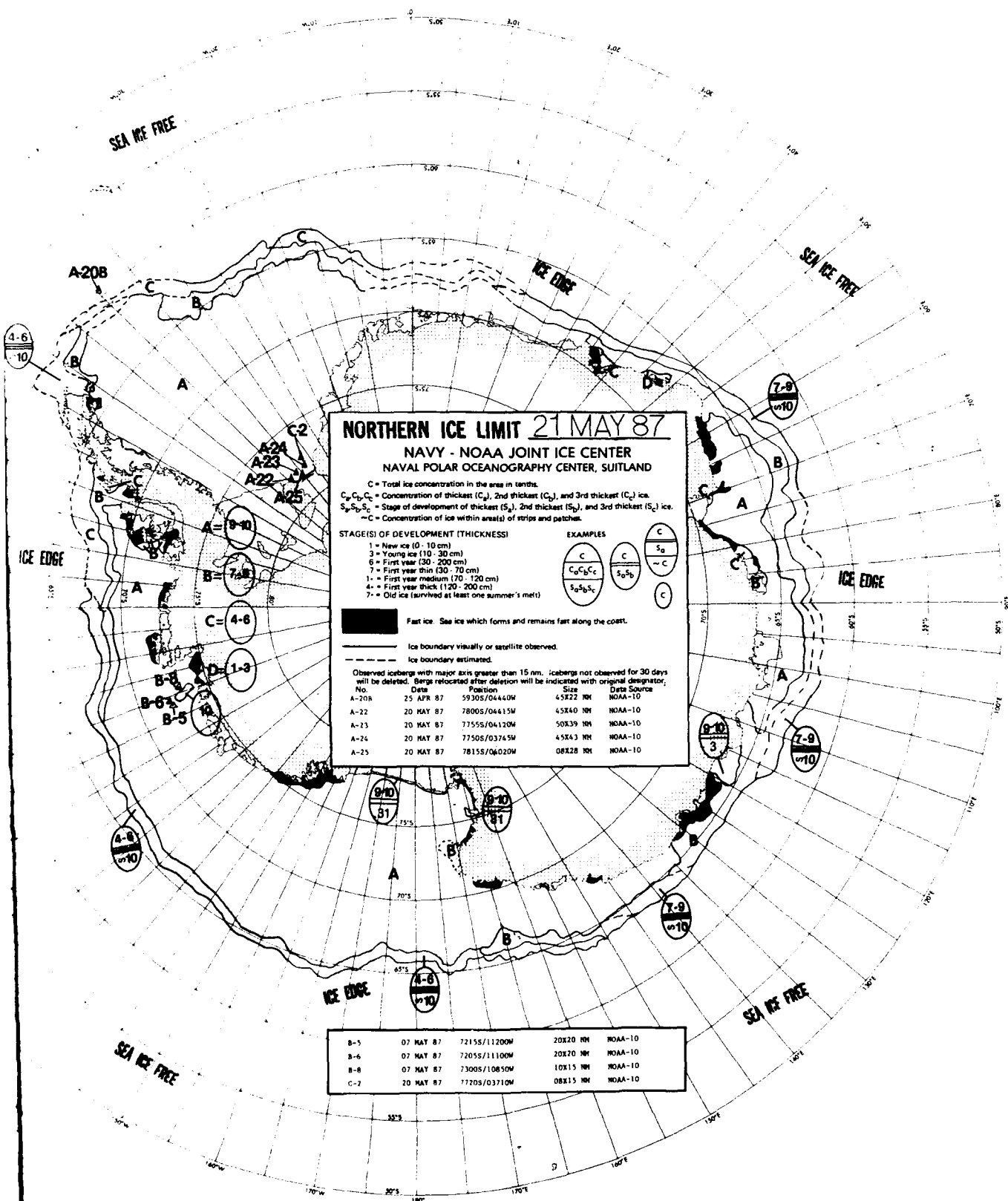
SEA ICE FREE

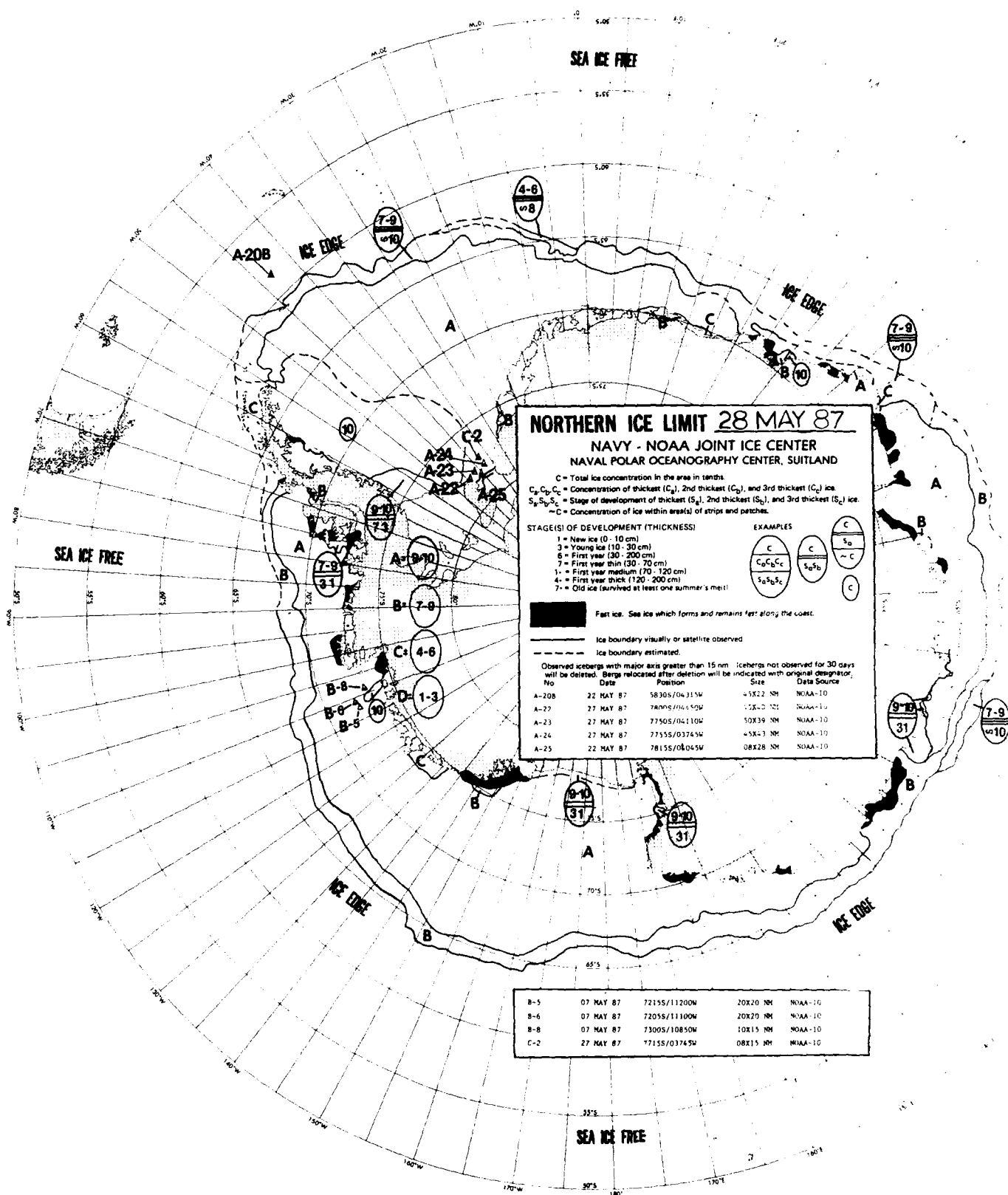


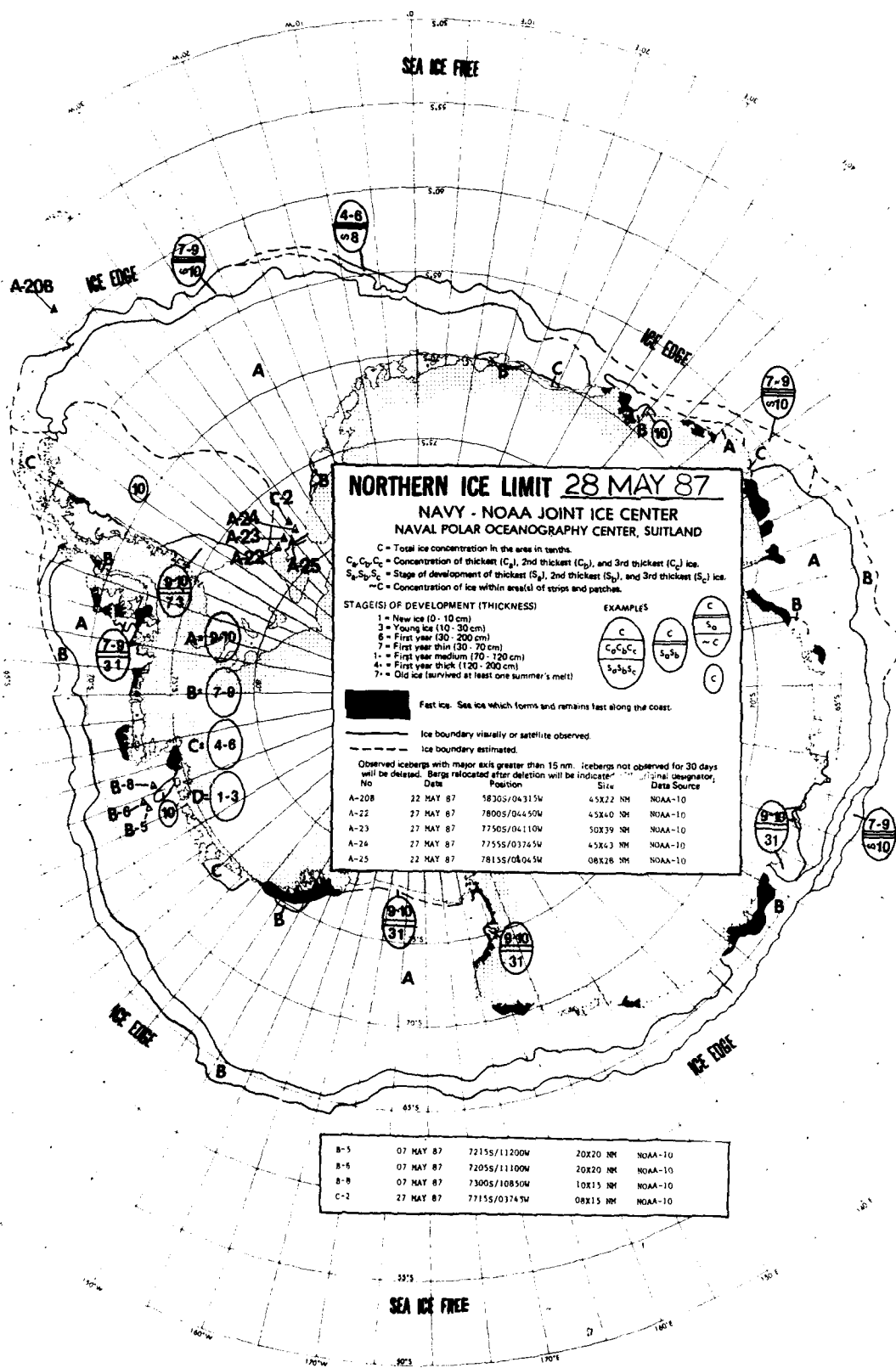
SEA ICE PREF

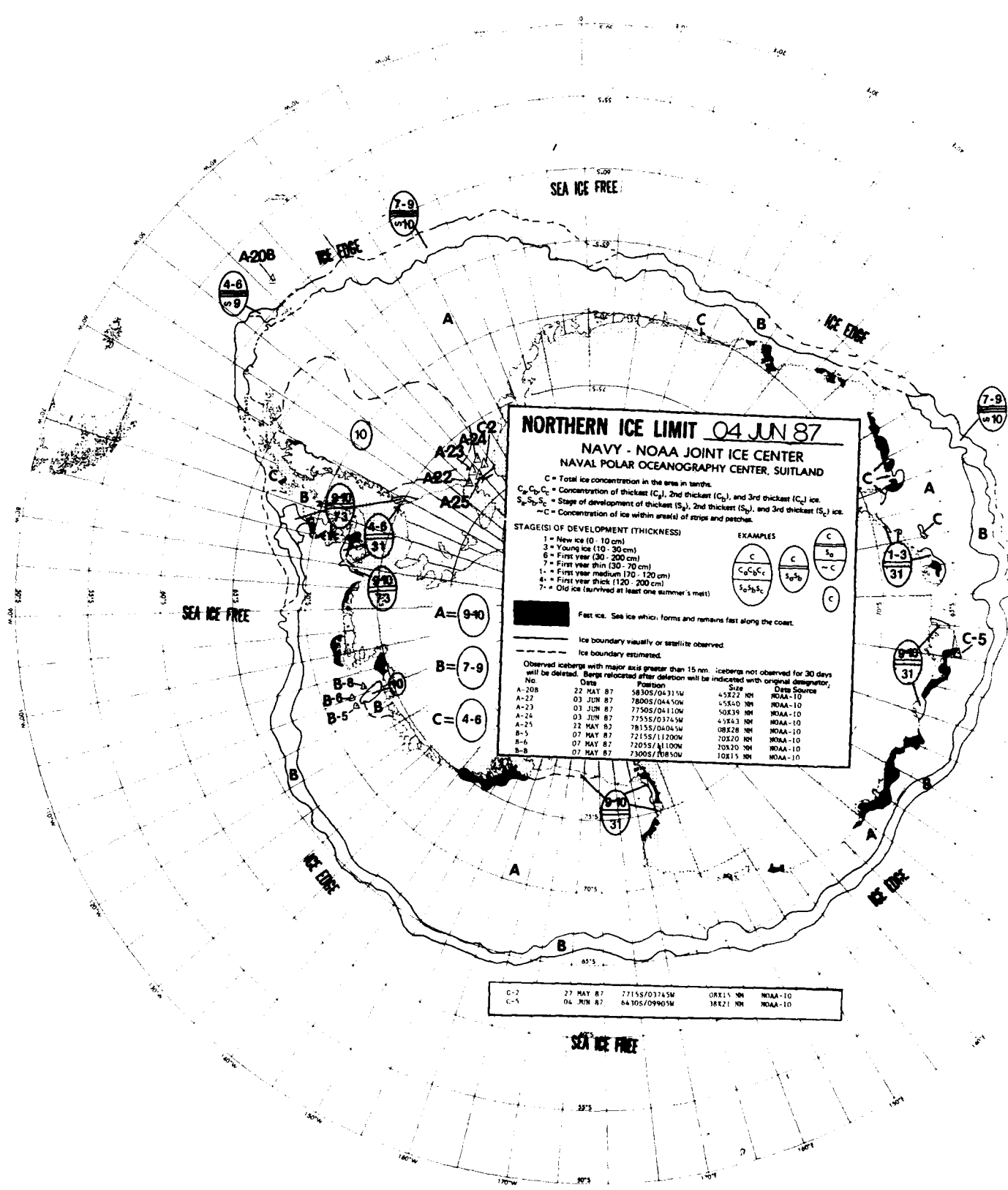




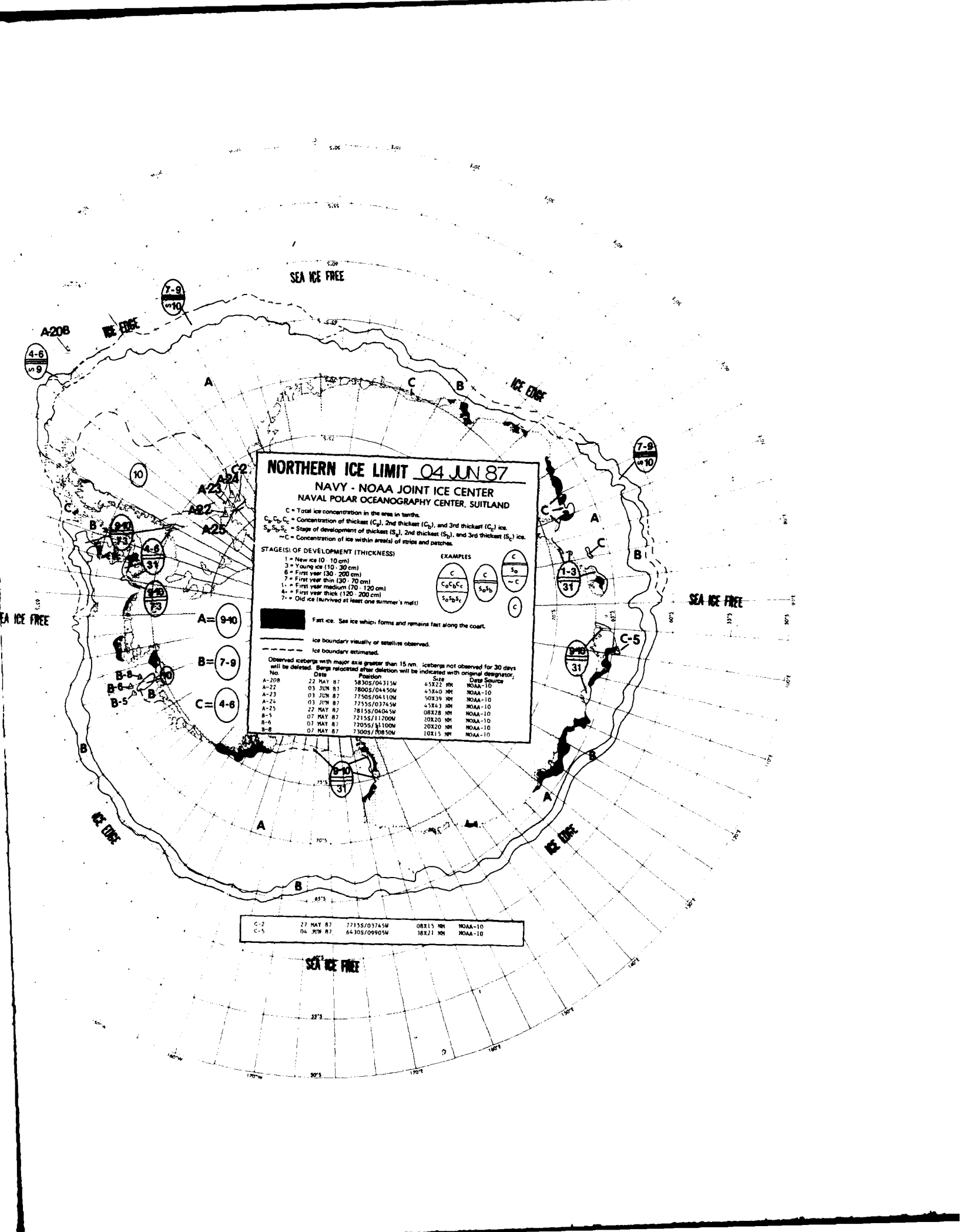


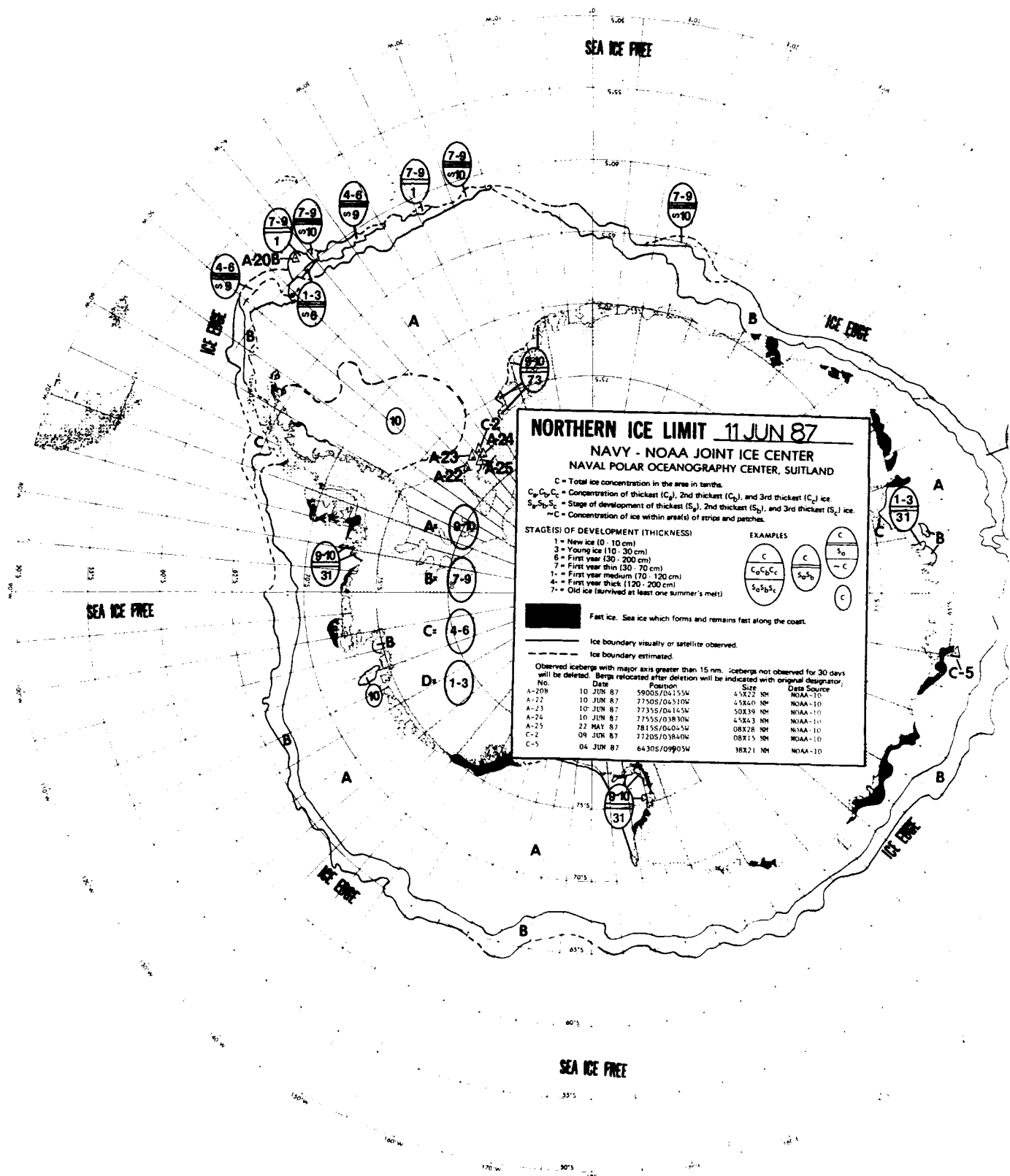


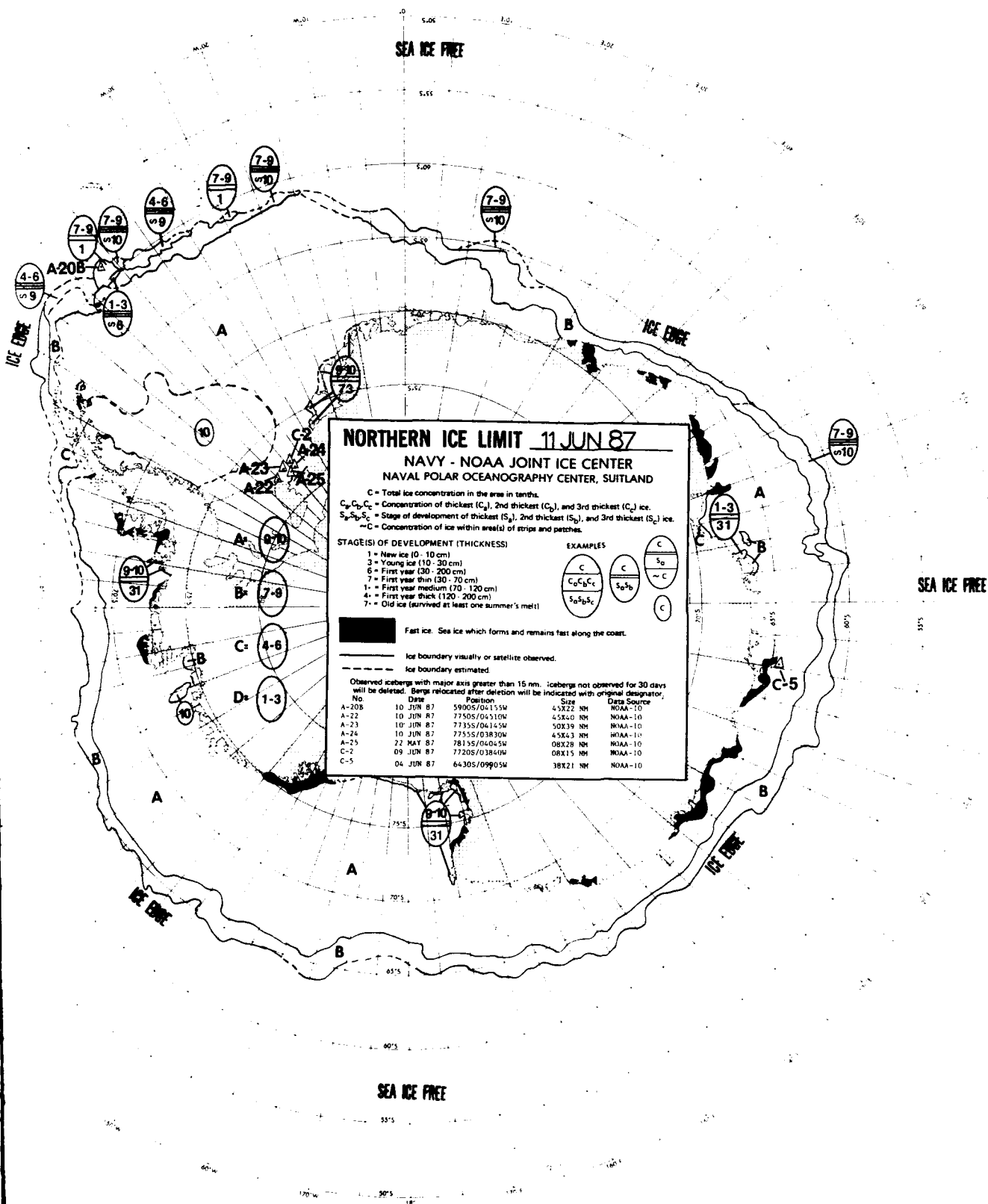


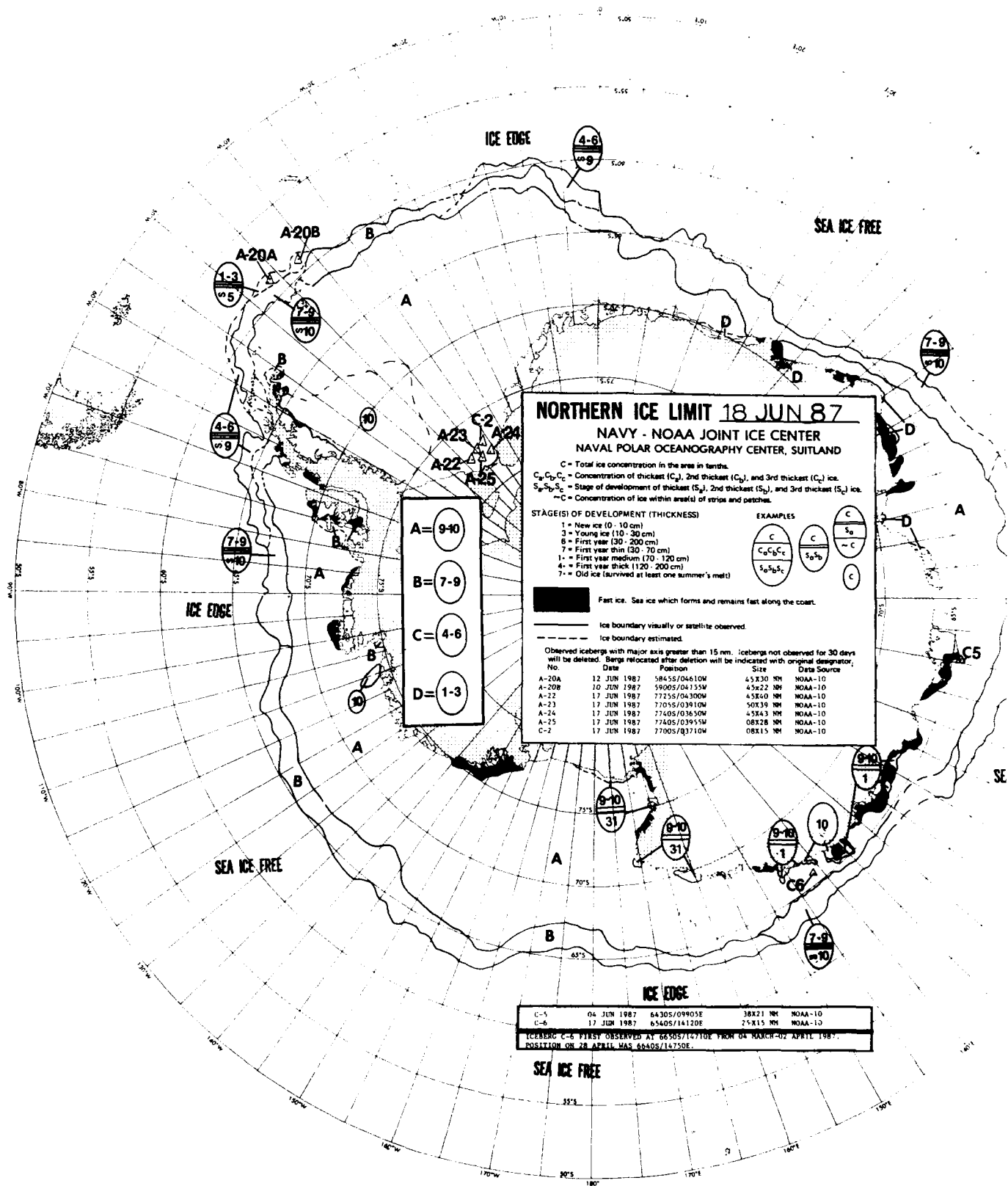


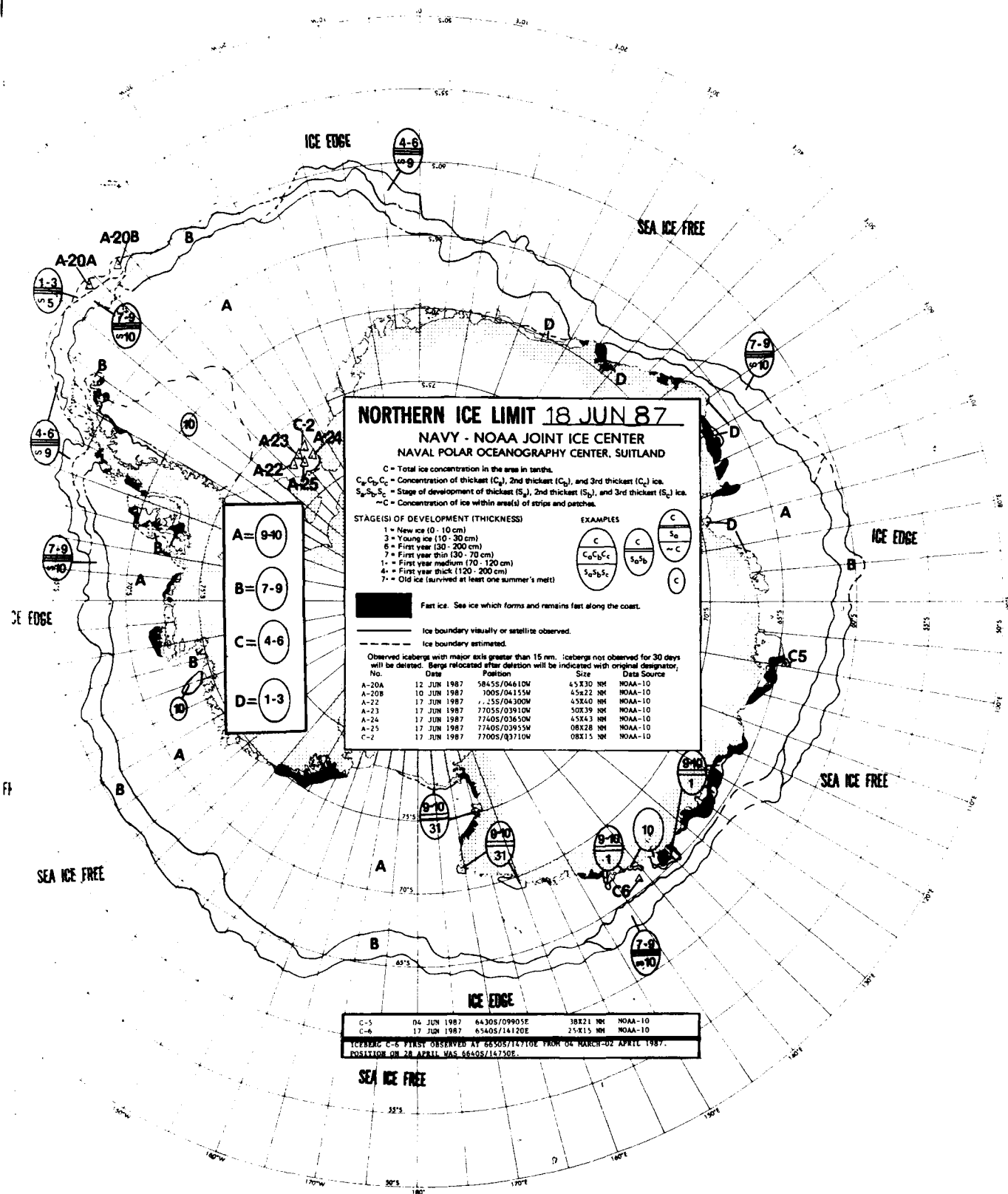
C-2	27 MAY 87	7715S/0374W	08X11 NM	NOAA-10
C-5	04 JUN 87	6430S/0990W	38X21 NM	NOAA-10

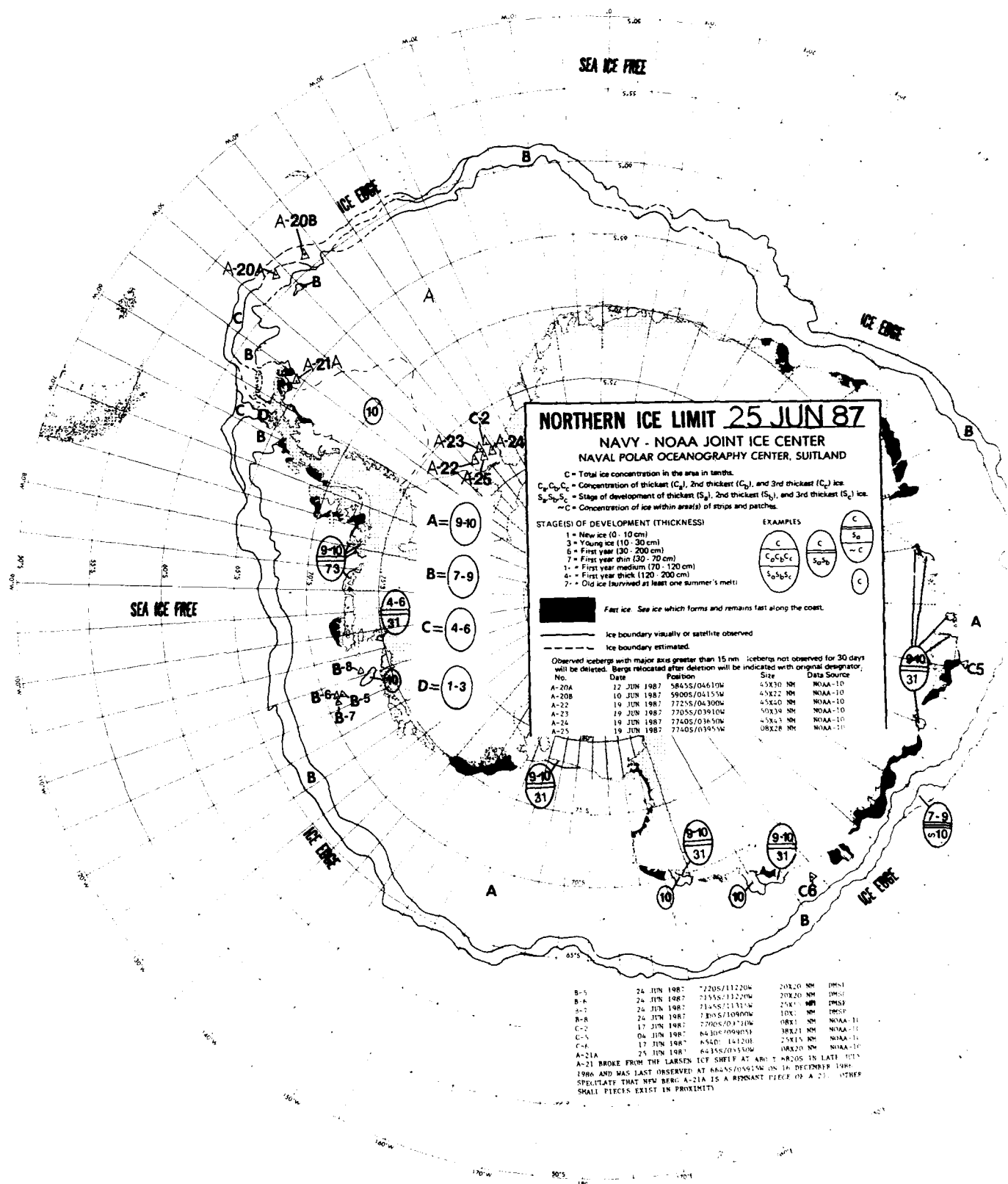


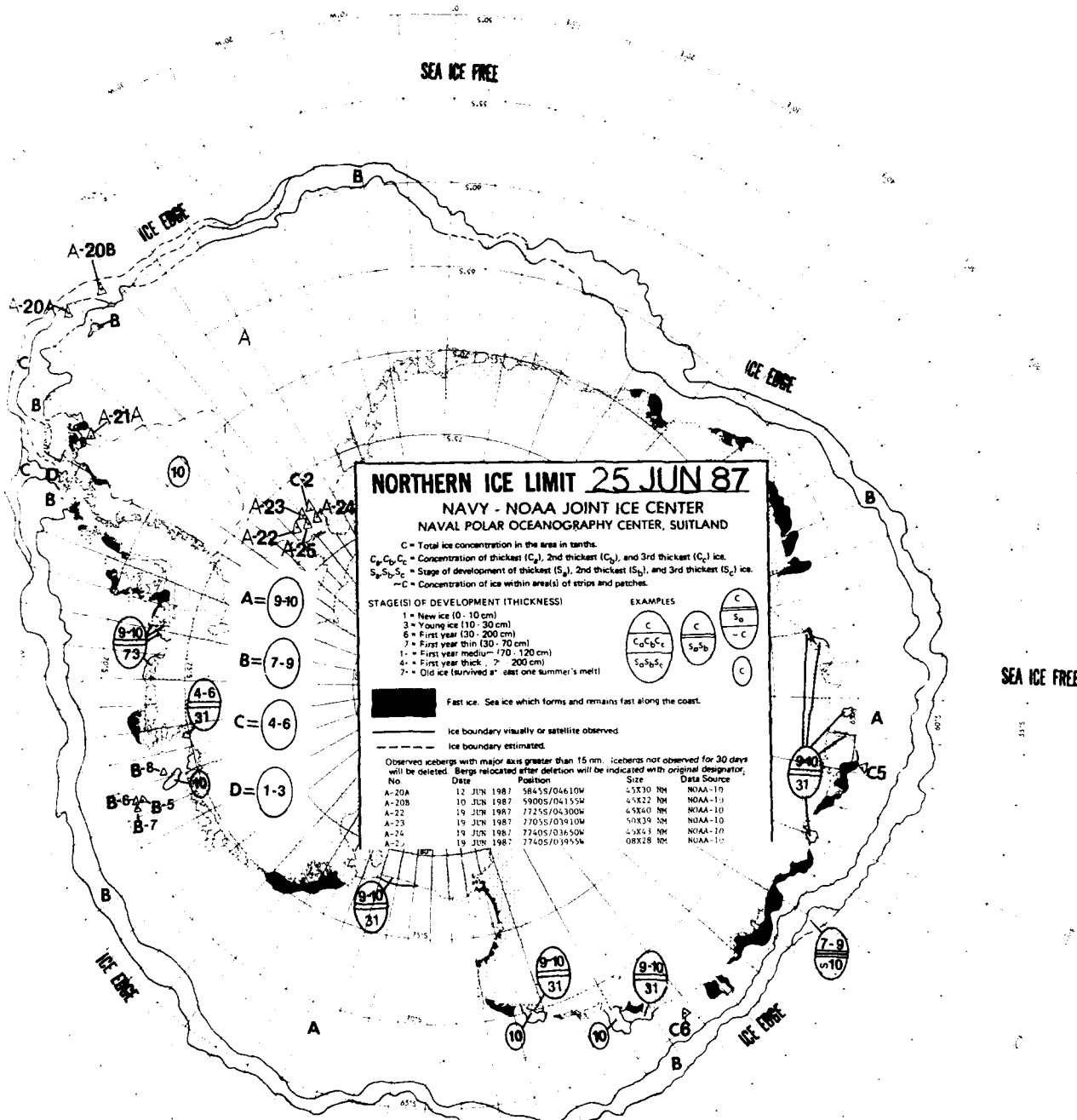








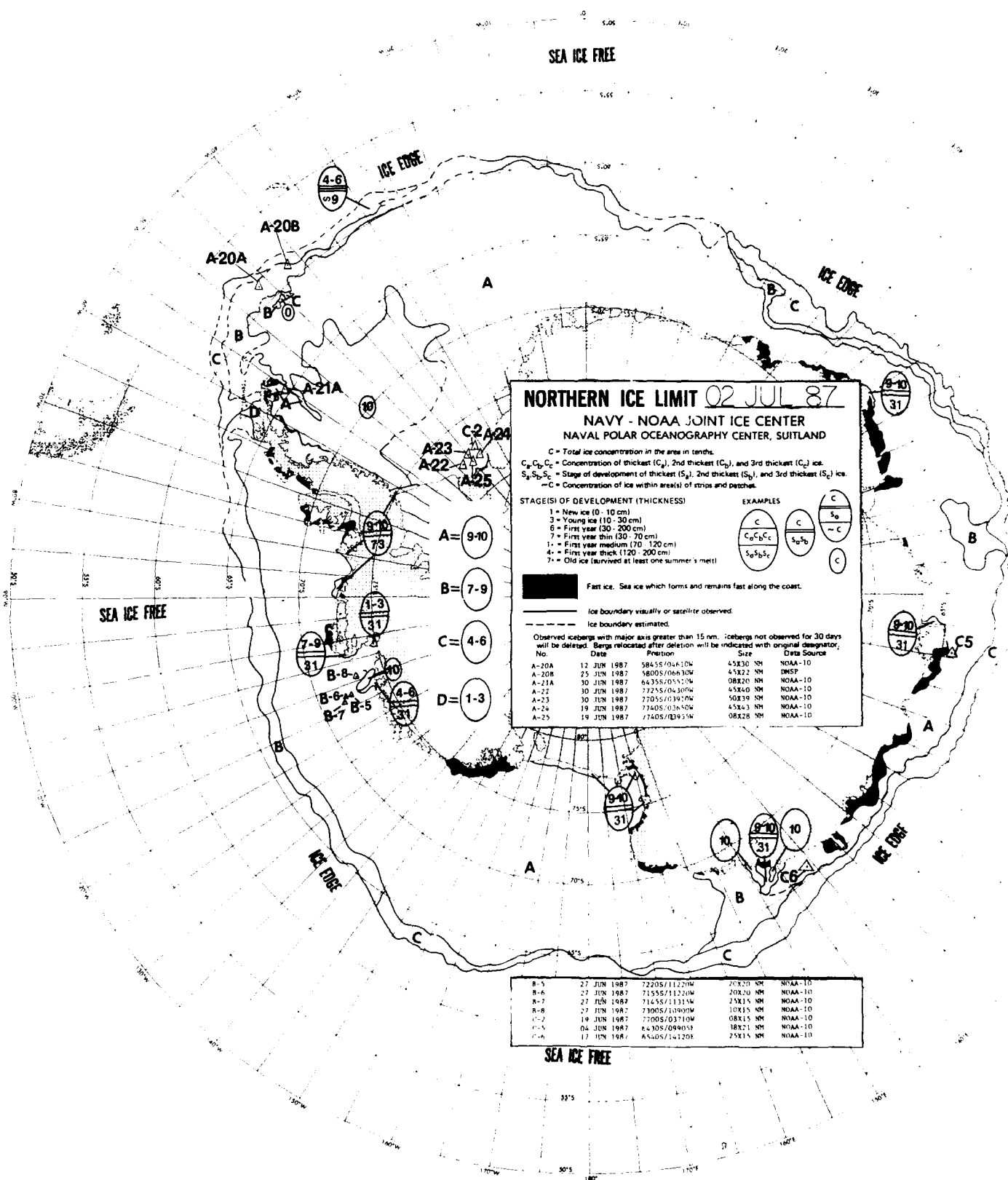


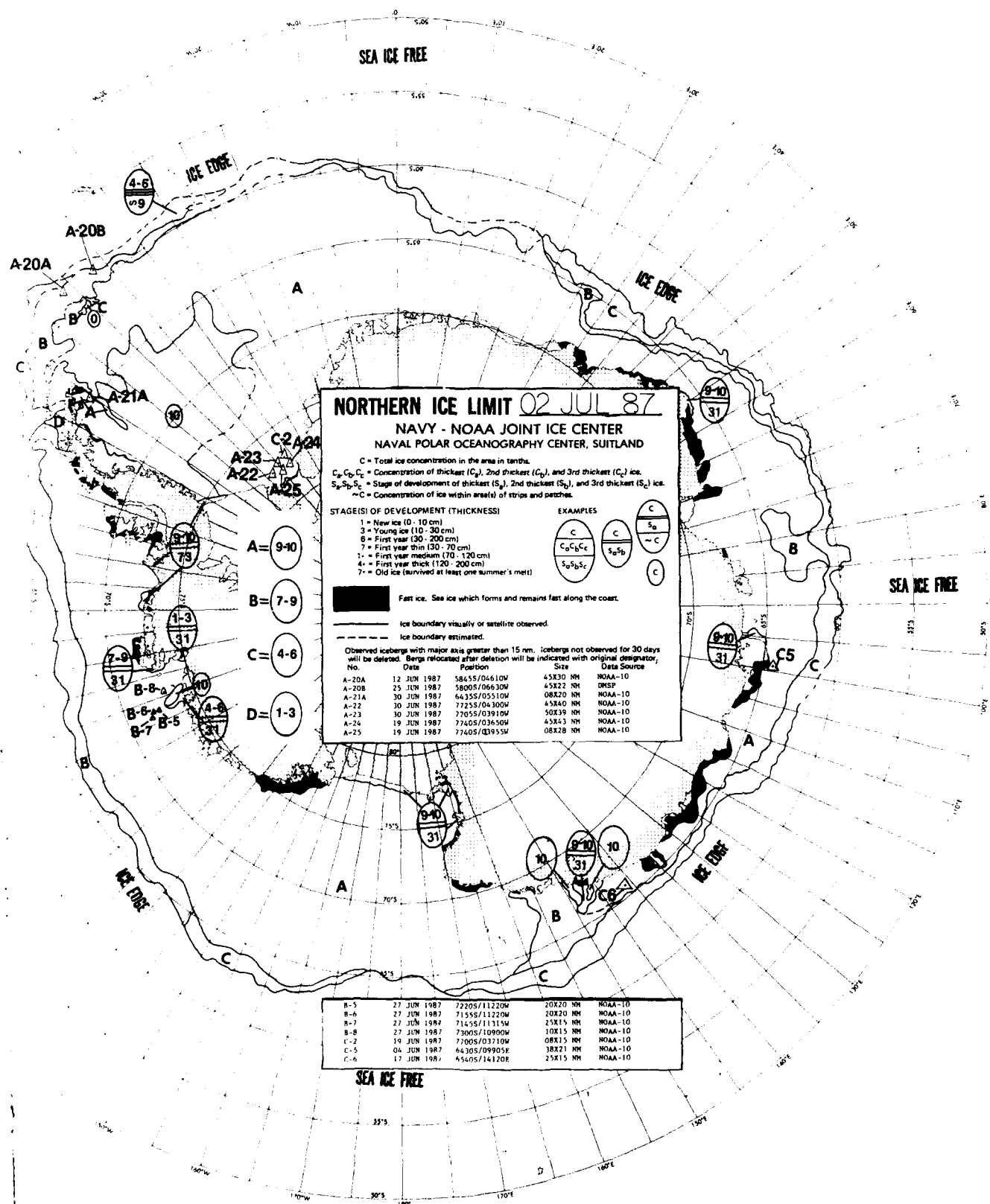


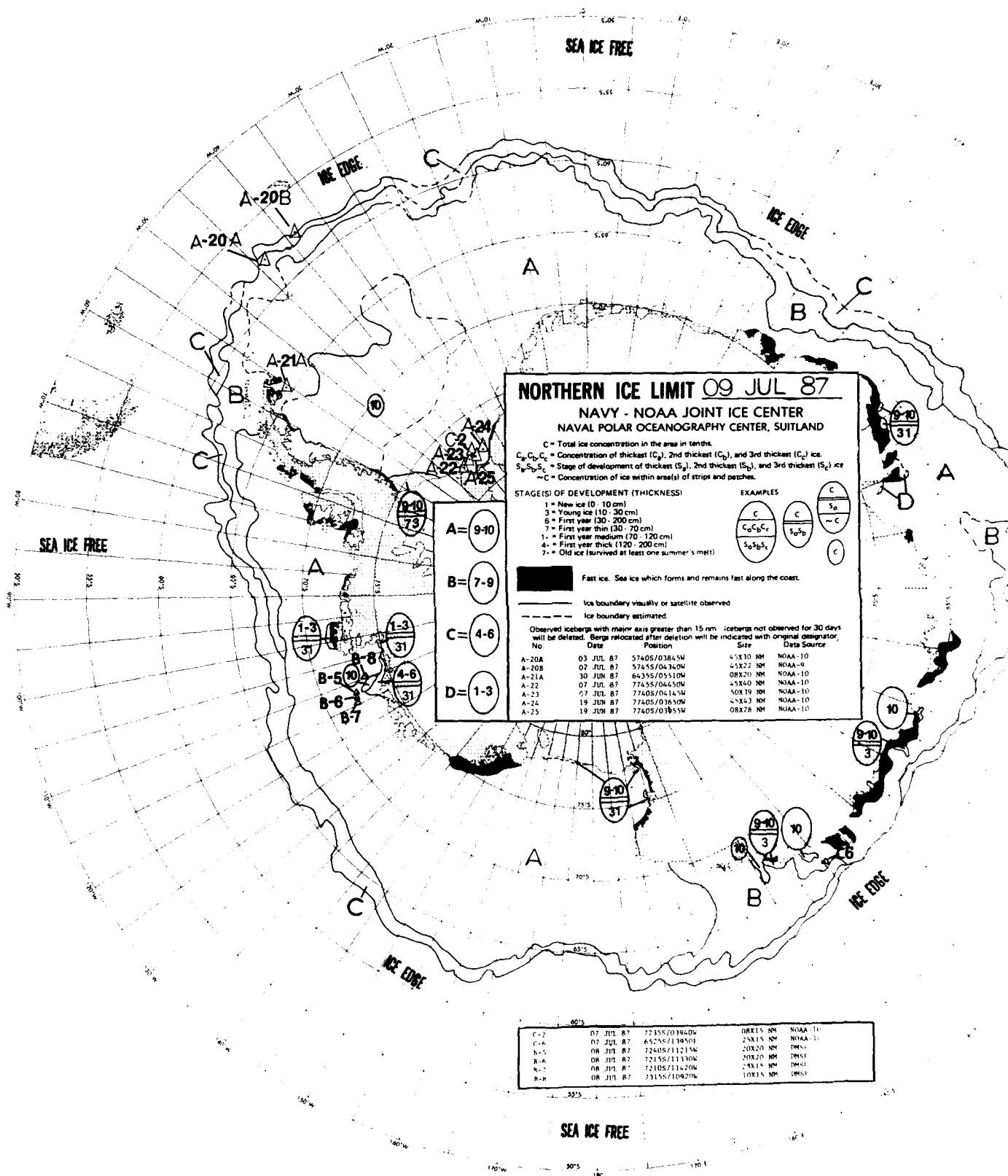
B-3	24 JUN 1987	7220S/11220W	20X20 NM	DMSP
B-4	24 JUN 1987	7155S/11220W	20X20 NM	DMSP
B-7	24 JUN 1987	7145S/11315W	25X15 NM	DMSP
B-8	24 JUN 1987	7105S/11600W	10X15 NM	DMSP
C-2	17 JUN 1987	7705S/03710W	08X15 NM	NOAA-10
C-4	04 JUN 1987	6430S/05965E	18X24 NM	NOAA-10
C-6	17 JUN 1987	6340S/14120E	25X15 NM	NOAA-10
A-21A	25 JUN 1987	6435S/05550W	08X20 NM	NOAA-10

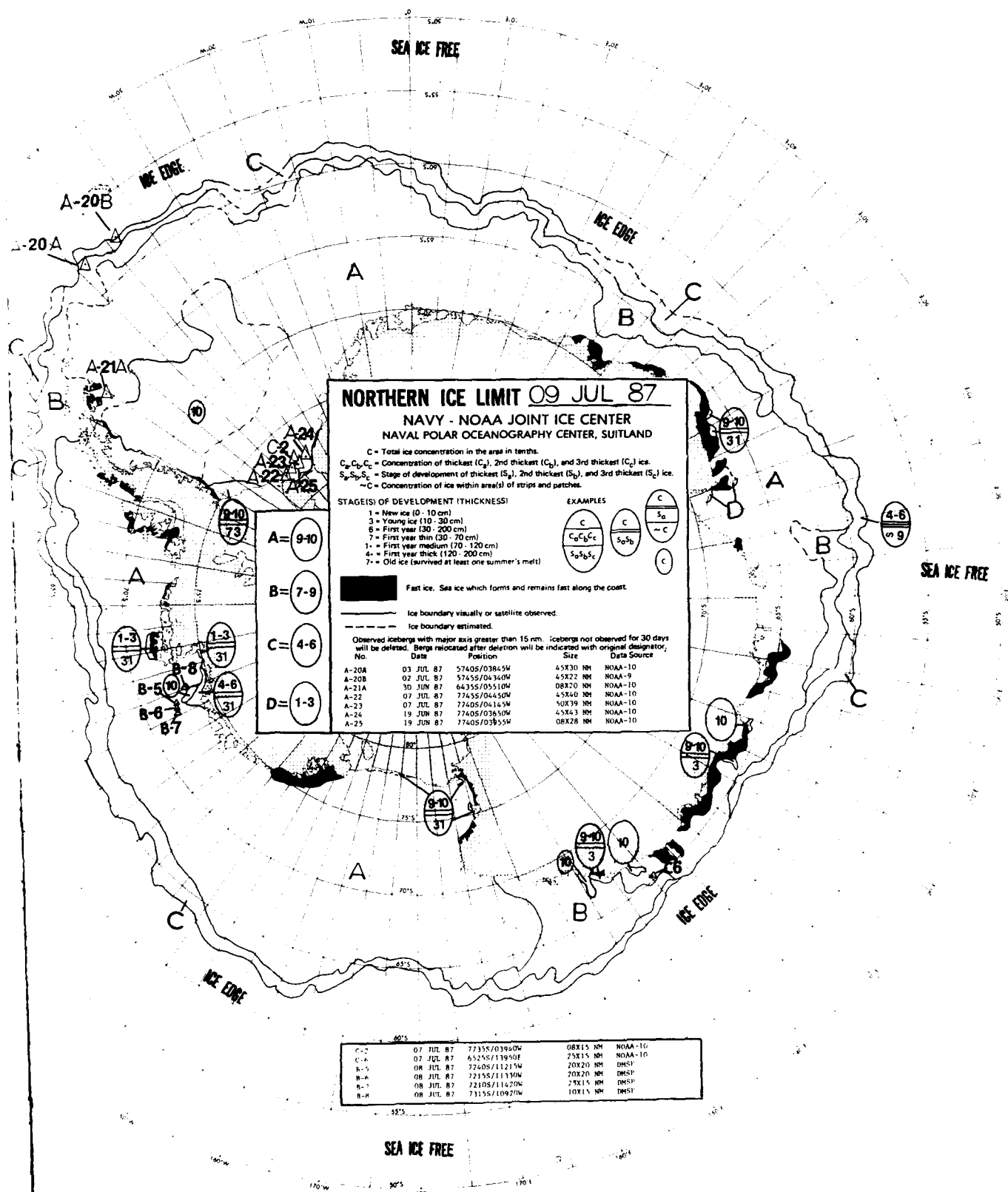
A-21 BROKE FROM THE LARSEN ICE SHELF AT ABOUT 6400S IN LATE JULY 1986 AND WAS LAST OBSERVED AT 6435S/05550W ON 16 DECEMBER 1986. SPECULATED THAT NEW BERGE A-21A IS A REMNANT PIECE OF A-21. OTHER SMALL PIECES EXIST IN PROXIMITY.

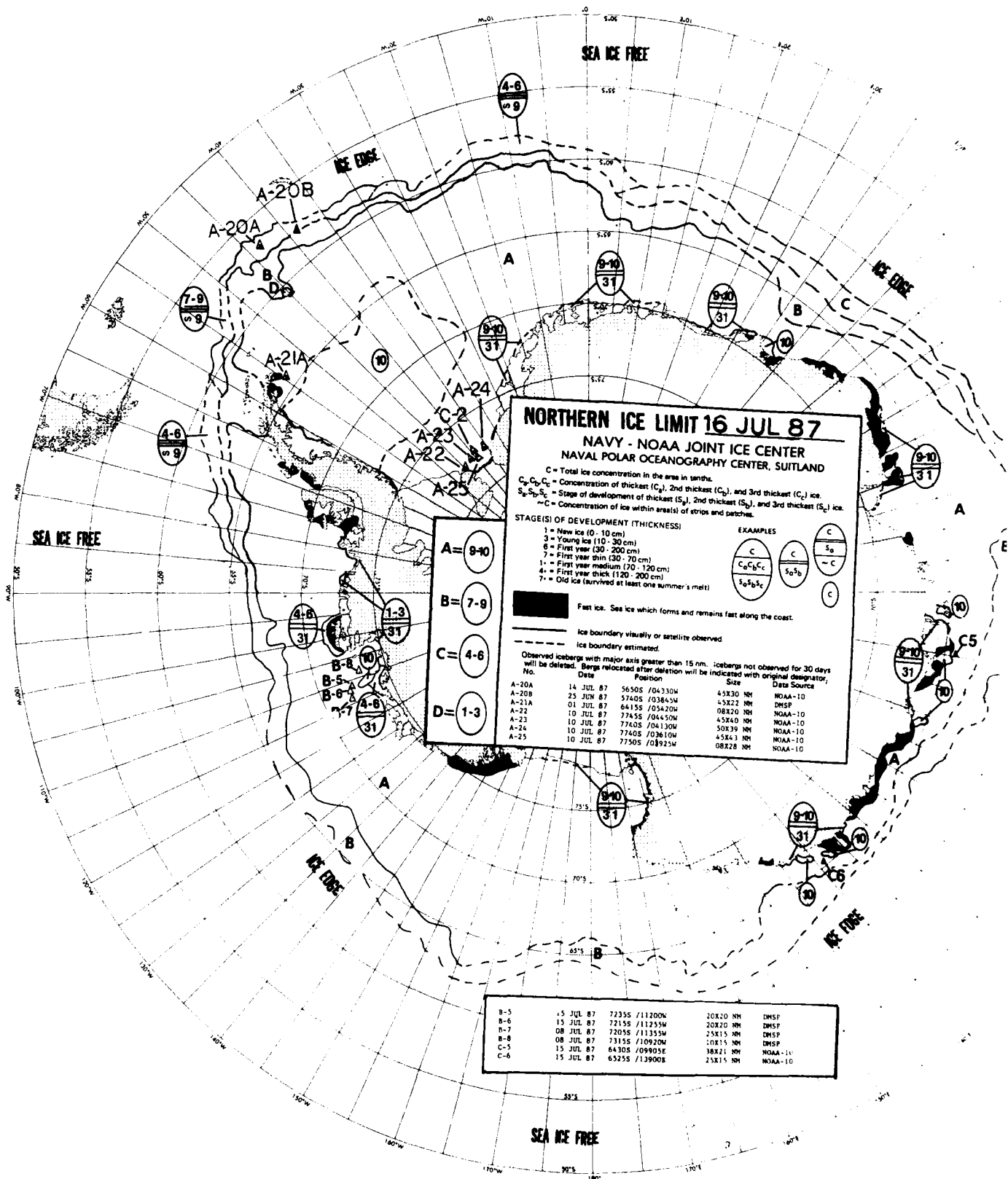
SEA ICE FREE

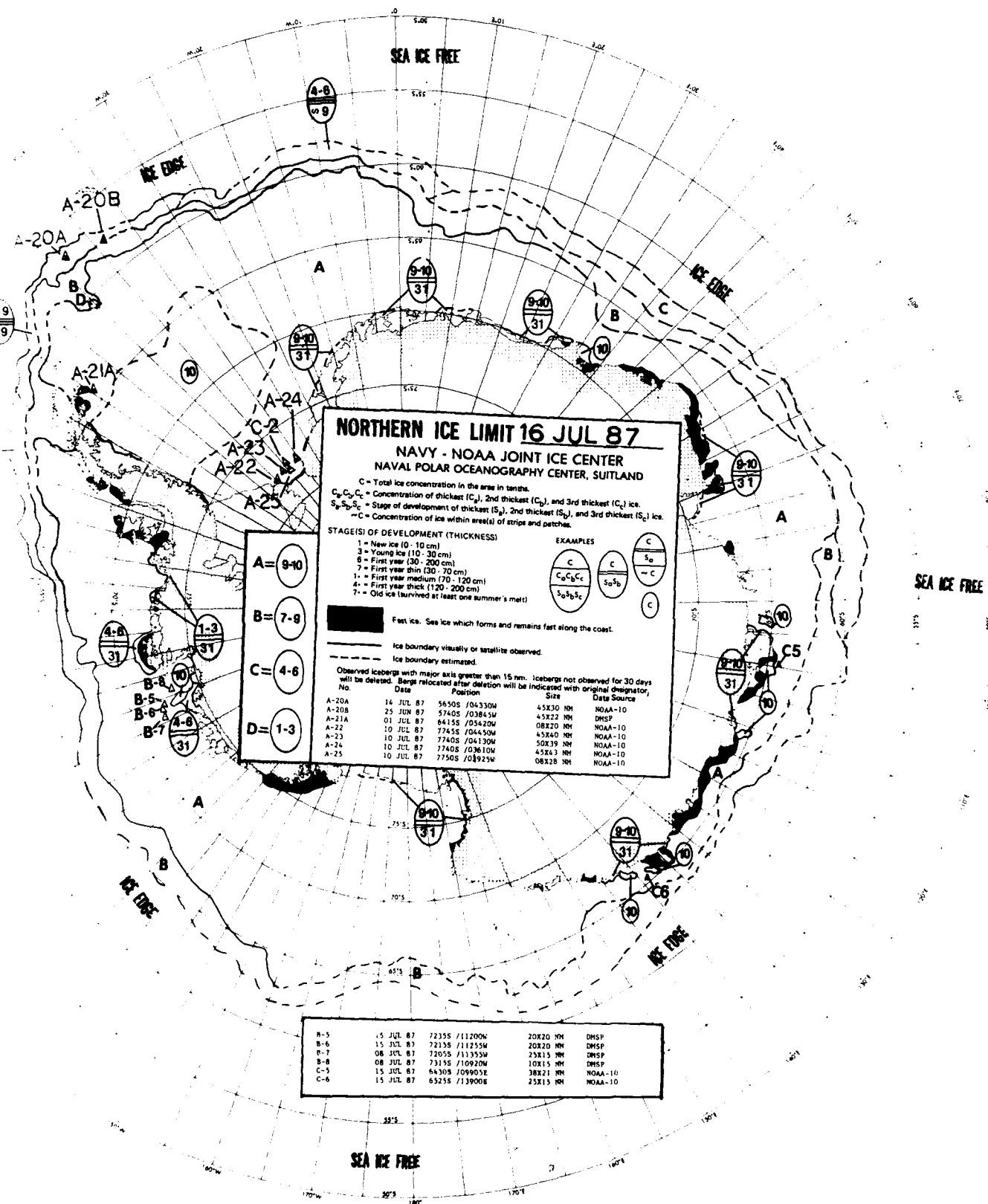


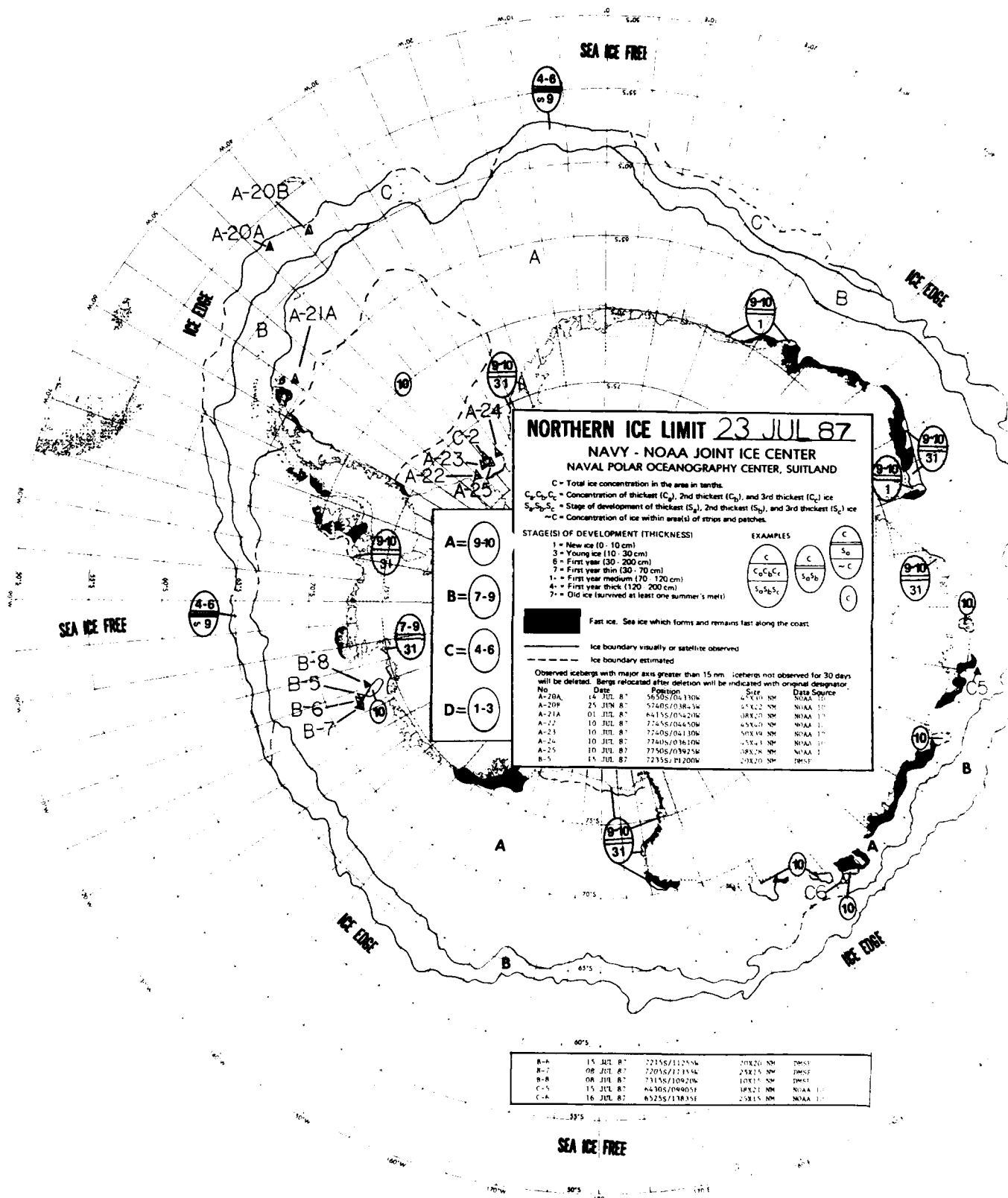


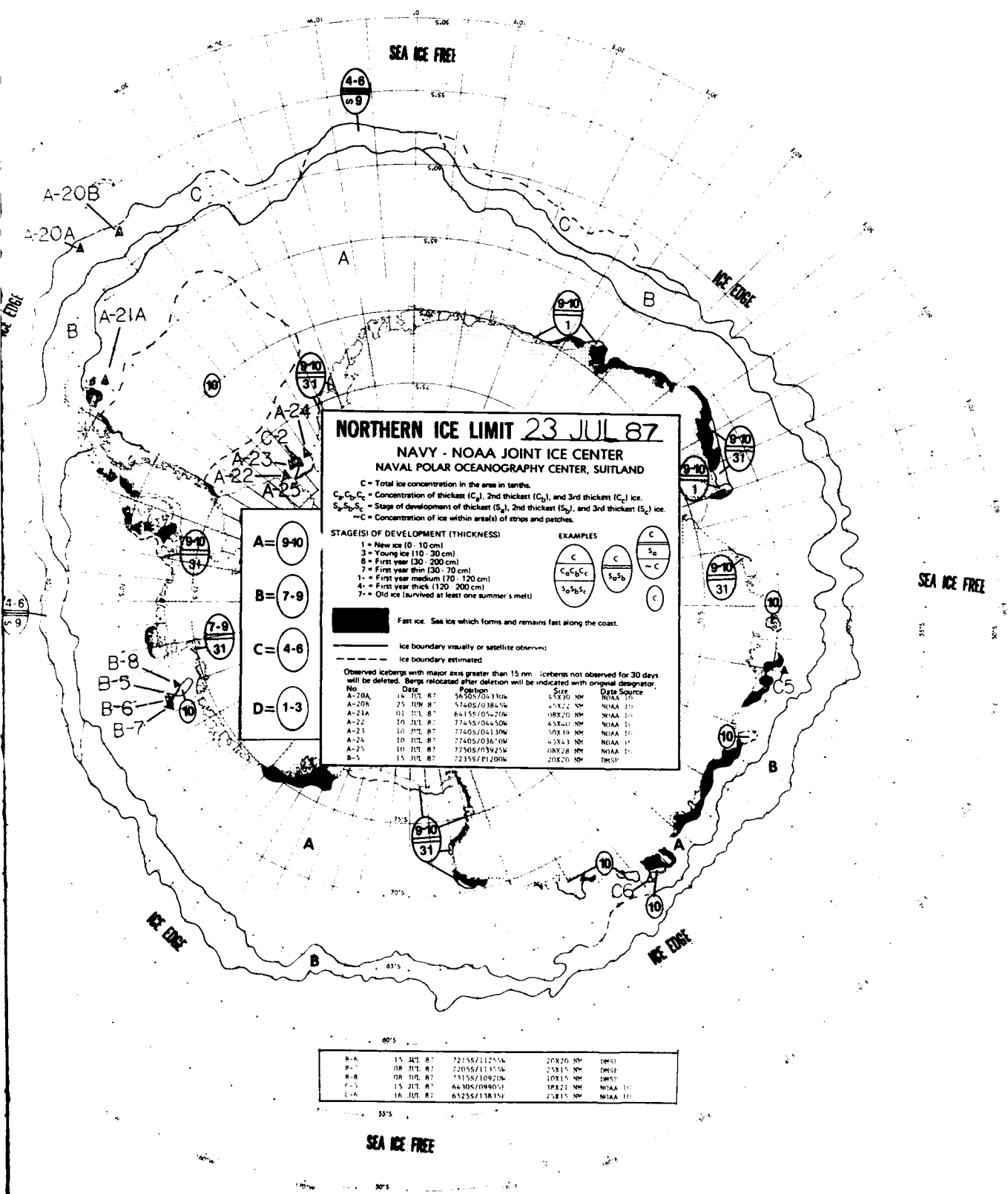


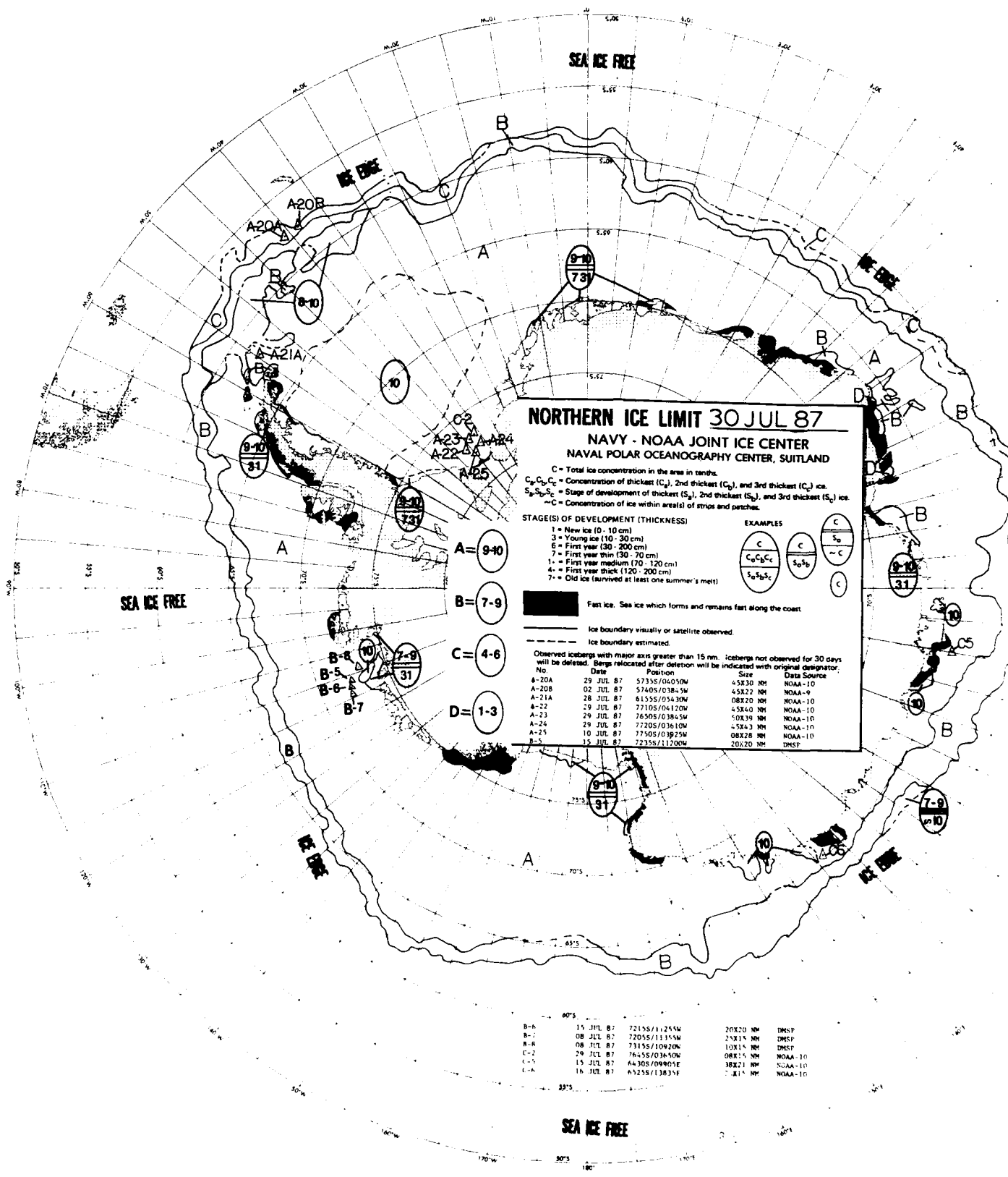




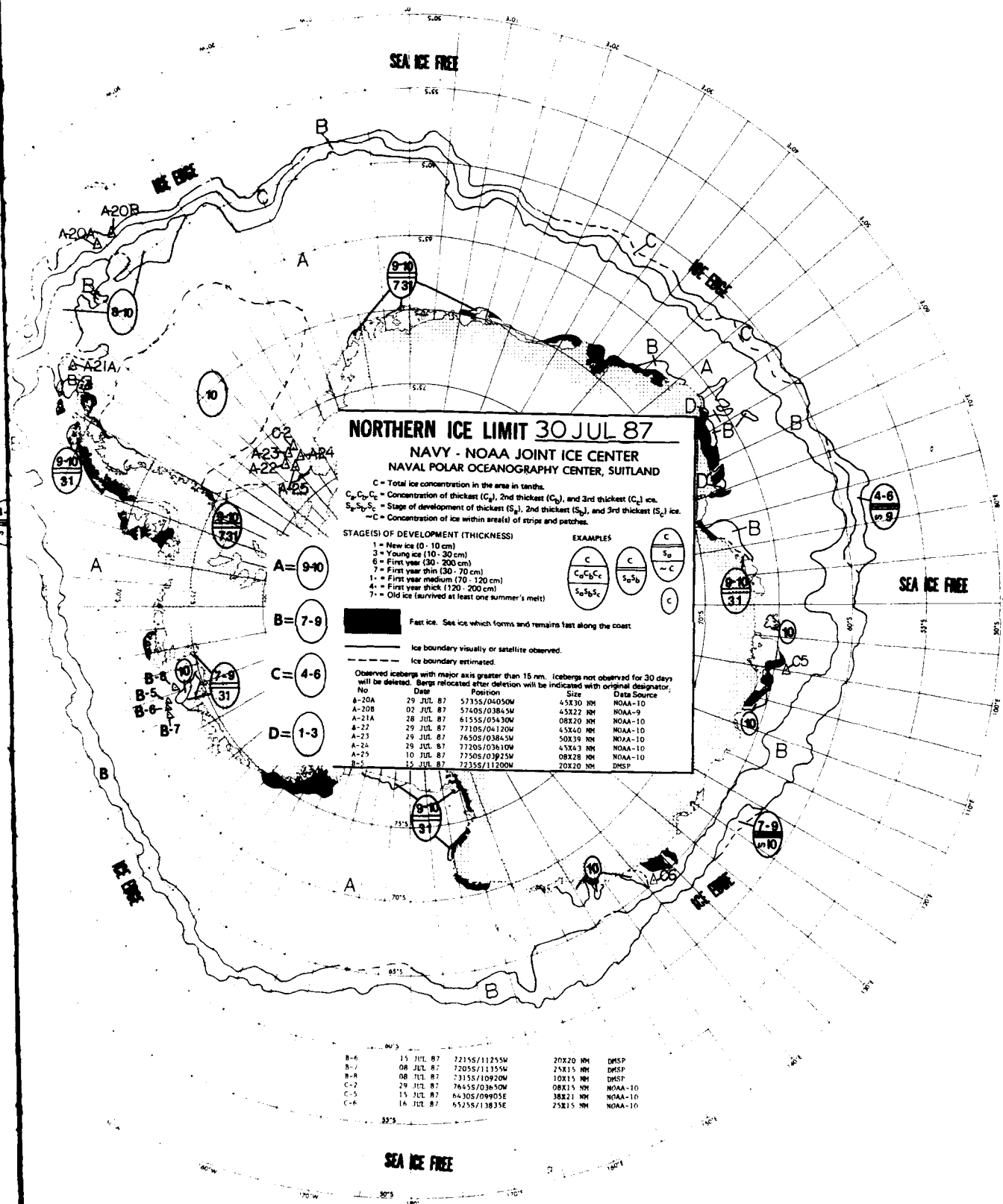


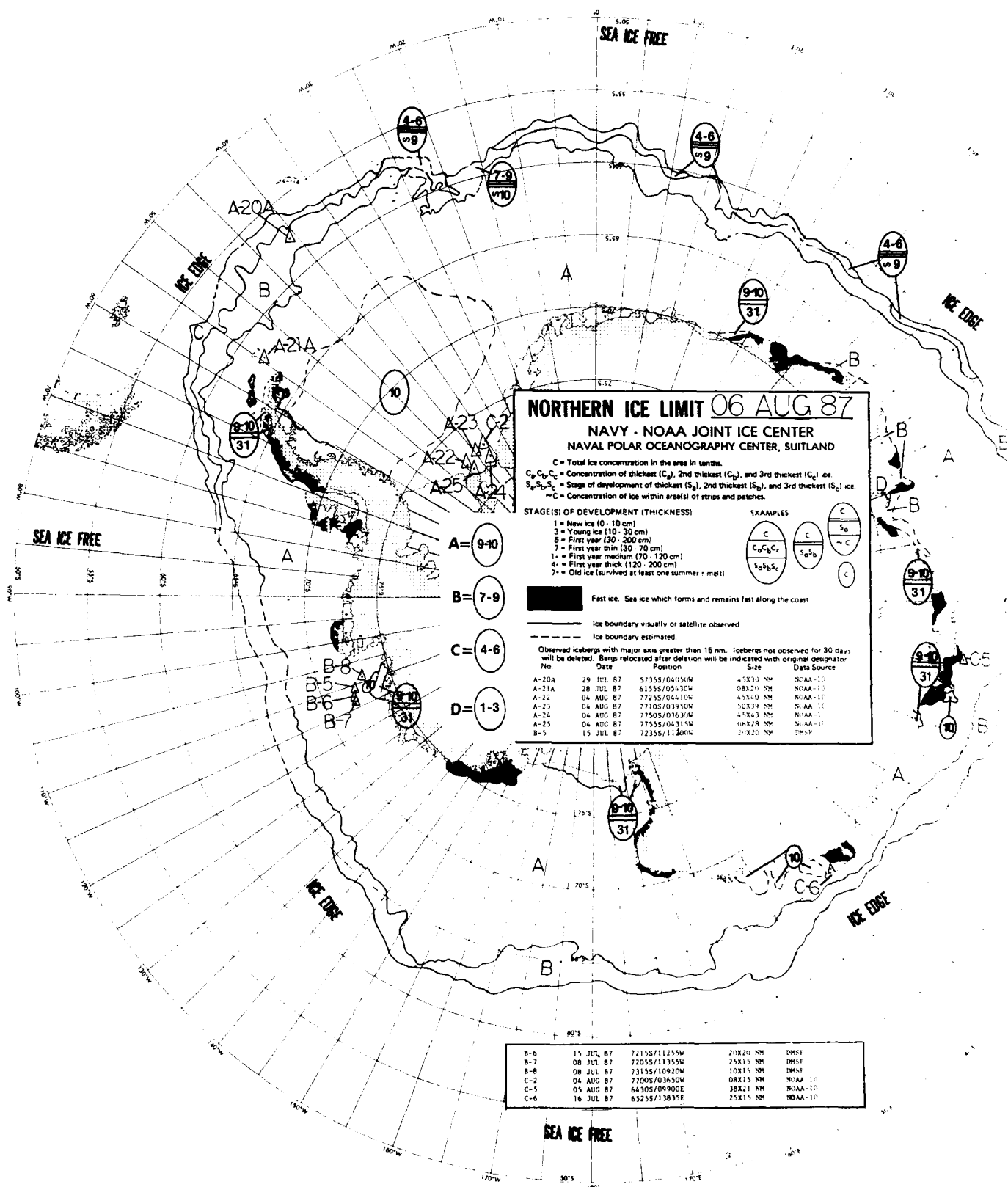


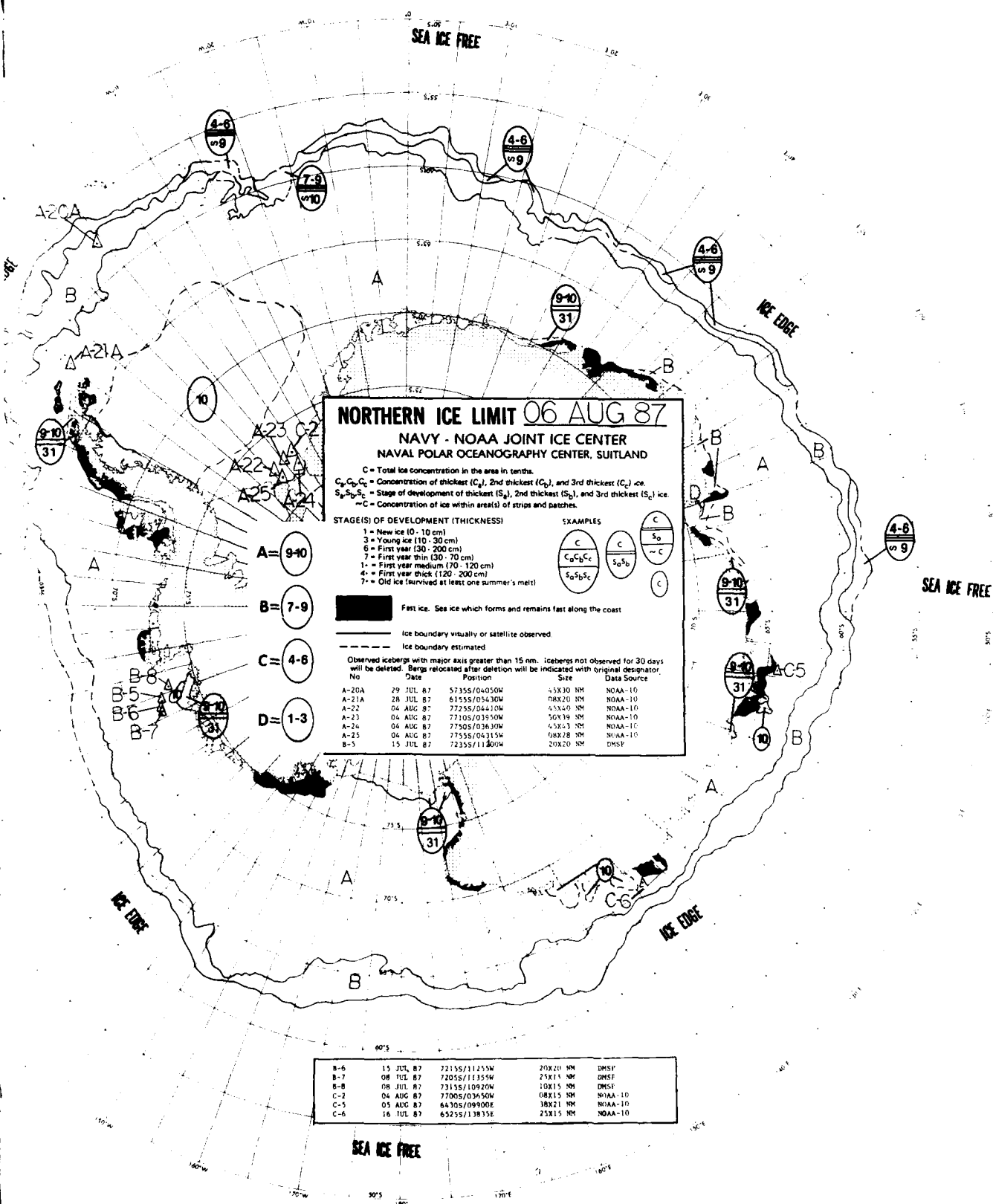


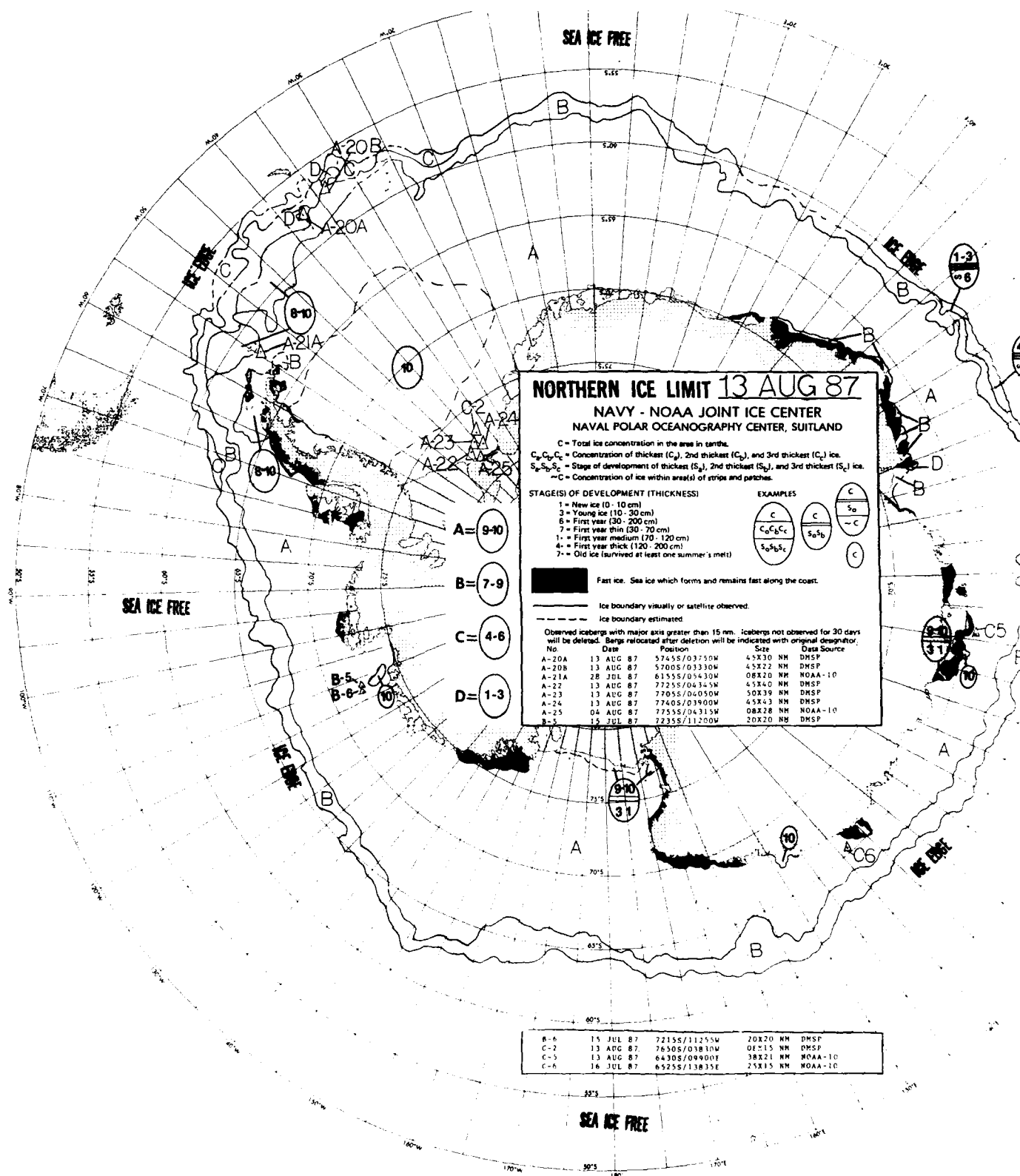


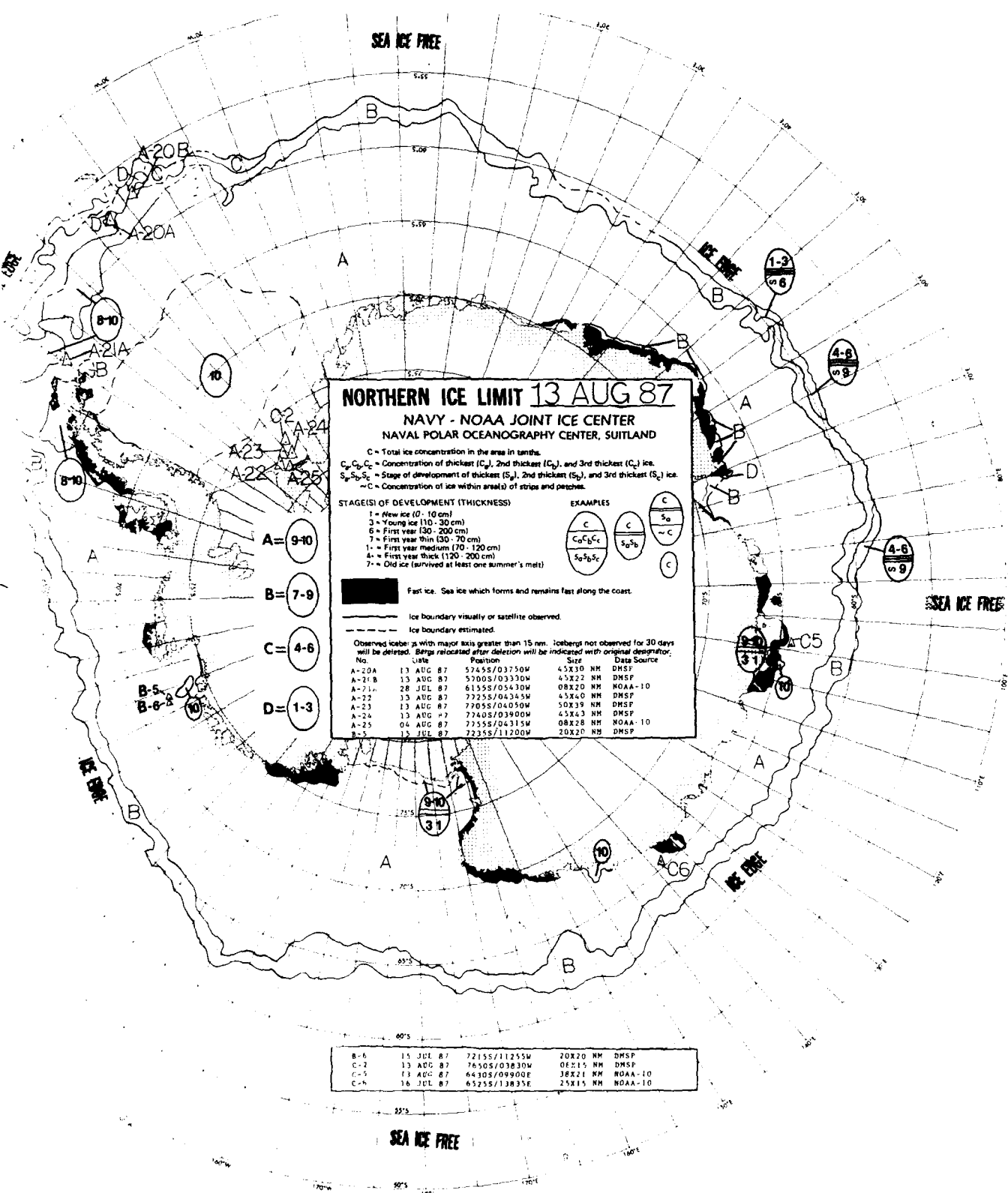
B-6	15 JUL 87	7215S/11255W	20X20 NM	DMSP
B-7	08 JUL 87	7205S/11155W	25X15 NM	DMSP
B-8	08 JUL 87	7315S/10920W	10X15 NM	DMSP
C-1	29 JUL 87	7645S/03850W	08X15 NM	NOAA-10
C-2	15 JUL 87	6430S/09005E	38X21 NM	NOAA-10
C-3	16 JUL 87	6525S/13835E	7.815 NM	NOAA-10











NORTHERN ICE LIMIT 13 AUG 87

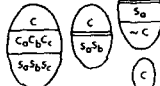
NAVY - NOAA JOINT ICE CENTER
NAVAL POLAR OCEANOGRAPHY CENTER, SUITLAND

C = Total ice concentration in the area in tenths.
 C_1, C_2, C_3 = Concentration of thickest (C_1), 2nd thickest (C_2), and 3rd thickest (C_3) ice.
 S_1, S_2, S_3 = Stage of development of thickest (S_1), 2nd thickest (S_2), and 3rd thickest (S_3) ice.
 -C = Concentration of ice within area(s) of strips and patches.

STAGE(S) OF DEVELOPMENT (THICKNESS)

- 1 = New ice (0 - 10 cm)
- 3 = Young ice (10 - 30 cm)
- 6 = First year (30 - 200 cm)
- 7 = First year thin (30 - 70 cm)
- 1 = First year medium (70 - 120 cm)
- 4 = First year thick (120 - 200 cm)
- 7 = Old ice (survived at least one summer's melt)

EXAMPLES

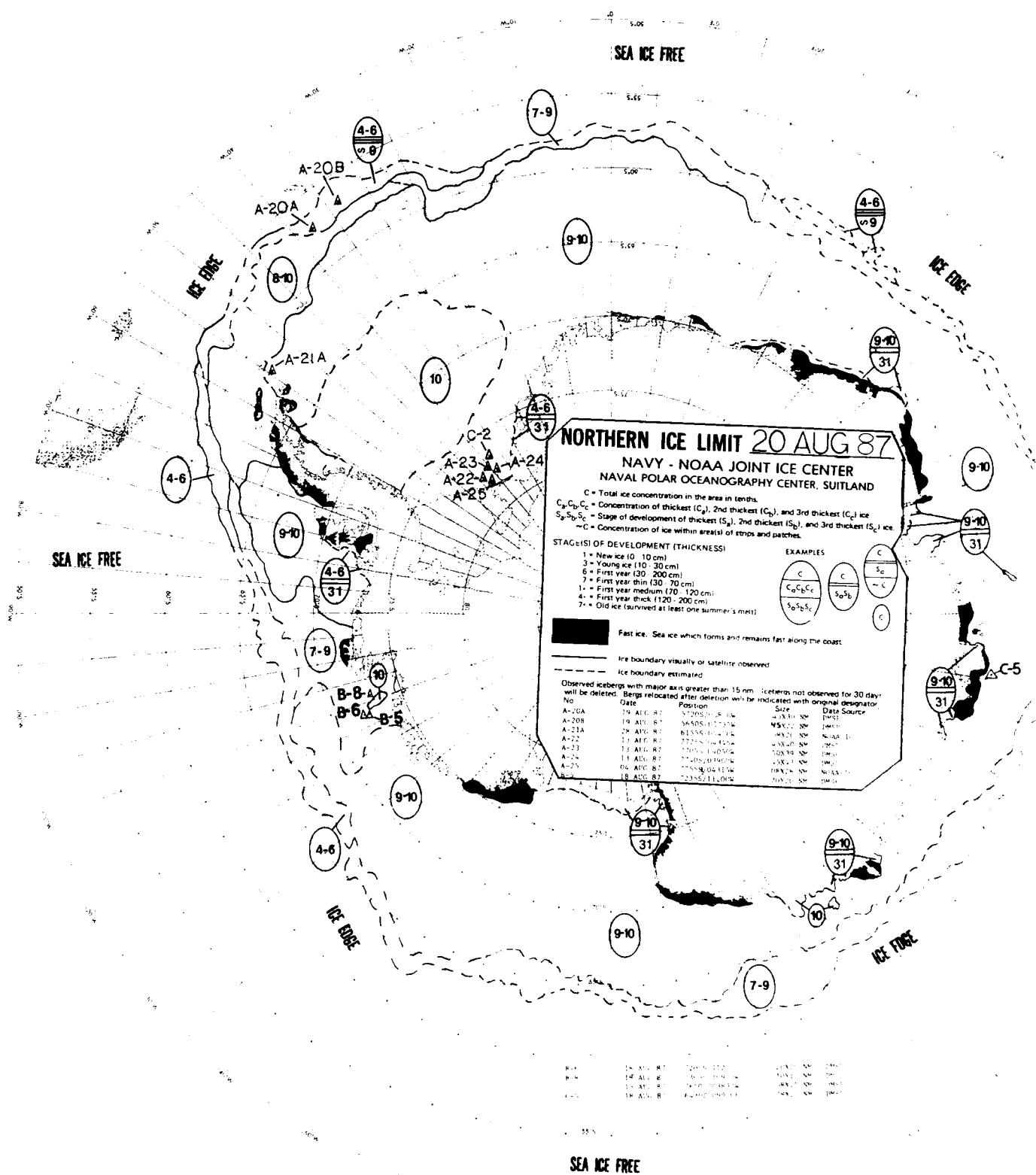


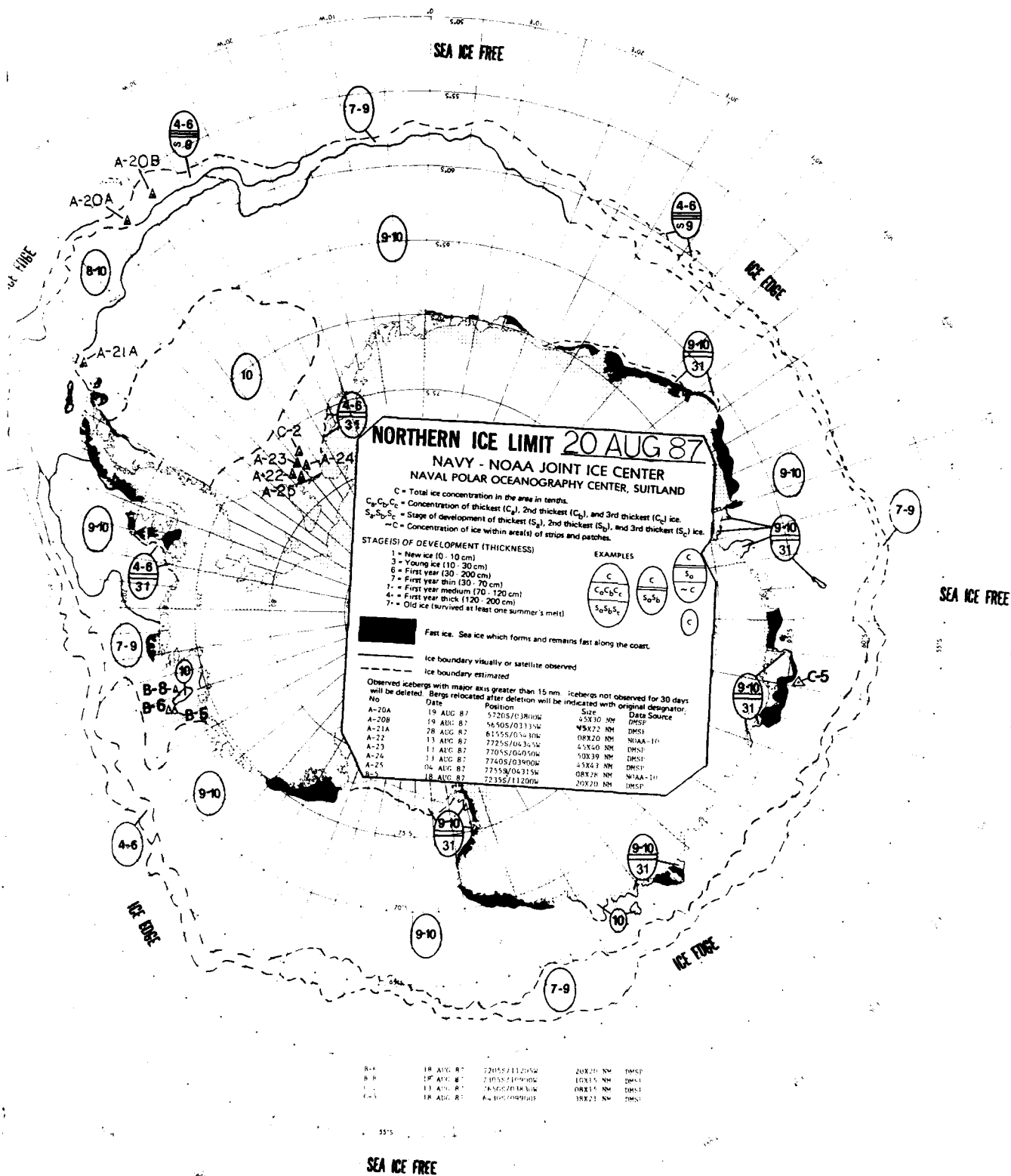
Fast ice. Sea ice which forms and remains fast along the coast.
 Ice boundary visually or satellite observed.
 Ice boundary estimated.

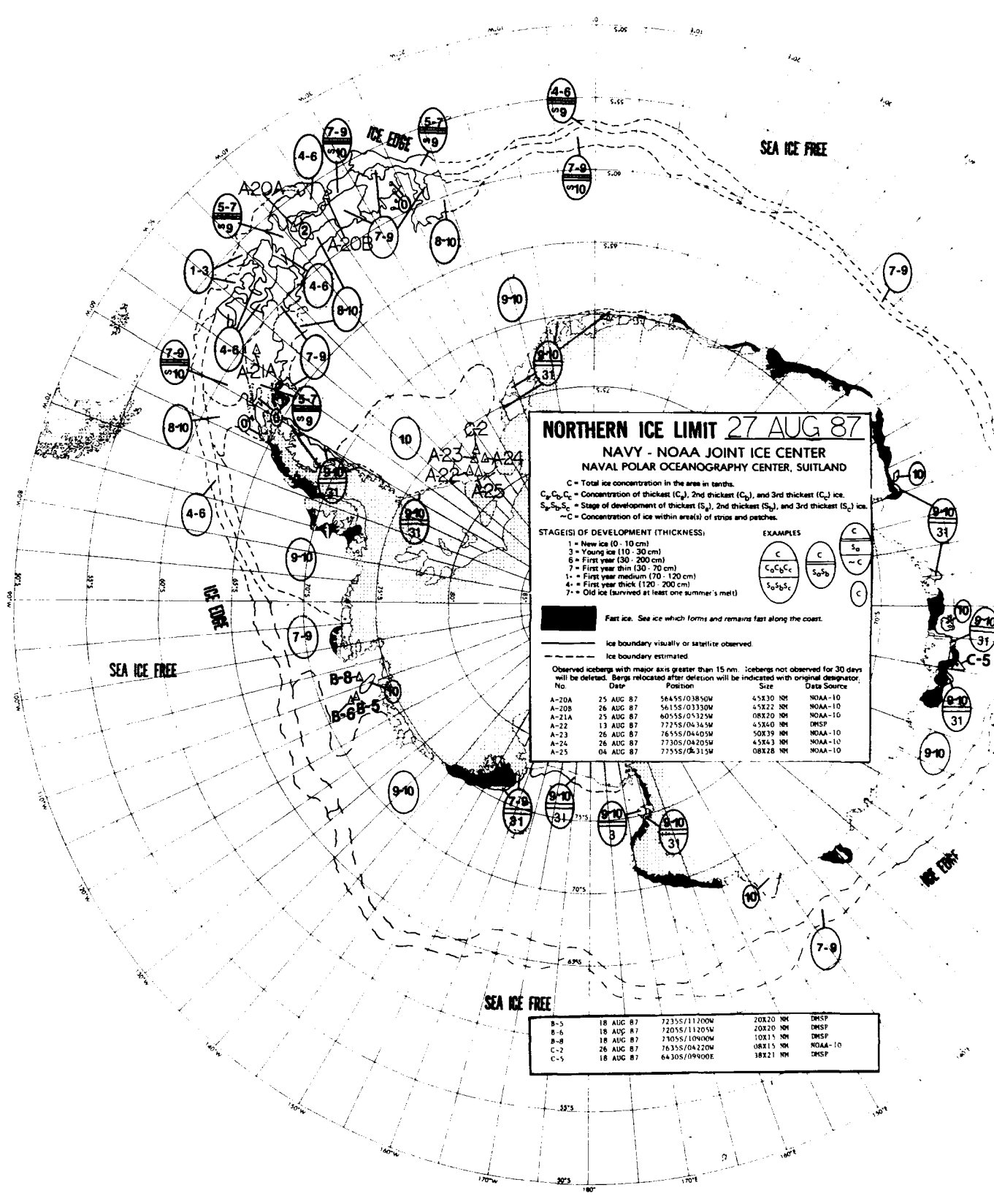
Observed icebergs with major axis greater than 15 nm. Icebergs not observed for 30 days will be deleted. Berge relocated after deletion will be indicated with original designator.

No.	Date	Position	Size	Data Source
A-20A	13 AUG 87	5745S/03750W	45X30 NM	DHSP
A-21A	13 AUG 87	5700S/03330W	45X22 NM	DHSP
A-21B	28 JUL 87	6155S/05430W	08X20 NM	NOAA-10
A-22	13 AUG 87	7225S/04345W	45X40 NM	DHSP
A-23	13 AUG 87	7705S/04050W	50X39 NM	DHSP
A-24	13 AUG 87	7740S/03900W	45X43 NM	DHSP
A-25	04 AUG 87	7255S/04315W	08X28 NM	NOAA-10
B-5	15 JUL 87	7235S/11200W	20X20 NM	DHSP

B-6	15 JUL 87	7215S/11255W	20X20 NM	DHSP
C-2	13 AUG 87	7650S/03830W	08X15 NM	DHSP
C-5	13 AUG 87	6430S/09900E	38X21 NM	NOAA-10
C-6	16 JUL 87	6525S/13835E	25X15 NM	NOAA-10







NORTHERN ICE LIMIT 27 AUG 87

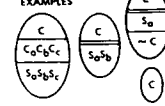
NAVY - NOAA JOINT ICE CENTER
NAVAL POLAR OCEANOGRAPHY CENTER, SUITLAND

C = Total ice concentration in the area in tenths.
C₁C₂C₃ = Concentration of thickest (C₁), 2nd thickest (C₂), and 3rd thickest (C₃) ice.
S₁S₂S₃ = Stage of development of thickest (S₁), 2nd thickest (S₂), and 3rd thickest (S₃) ice.
-C = Concentration of ice within area(s) of strips and patches.

STAGE(S) OF DEVELOPMENT (THICKNESS):

- 1 = New ice (0 - 10 cm)
- 3 = Young ice (10 - 30 cm)
- 6 = First year (30 - 200 cm)
- 7 = First year thin (30 - 70 cm)
- 1 = First year medium (70 - 120 cm)
- 4 = First year thick (120 - 200 cm)
- 7 = Old ice (survived at least one summer's melt)

EXAMPLES



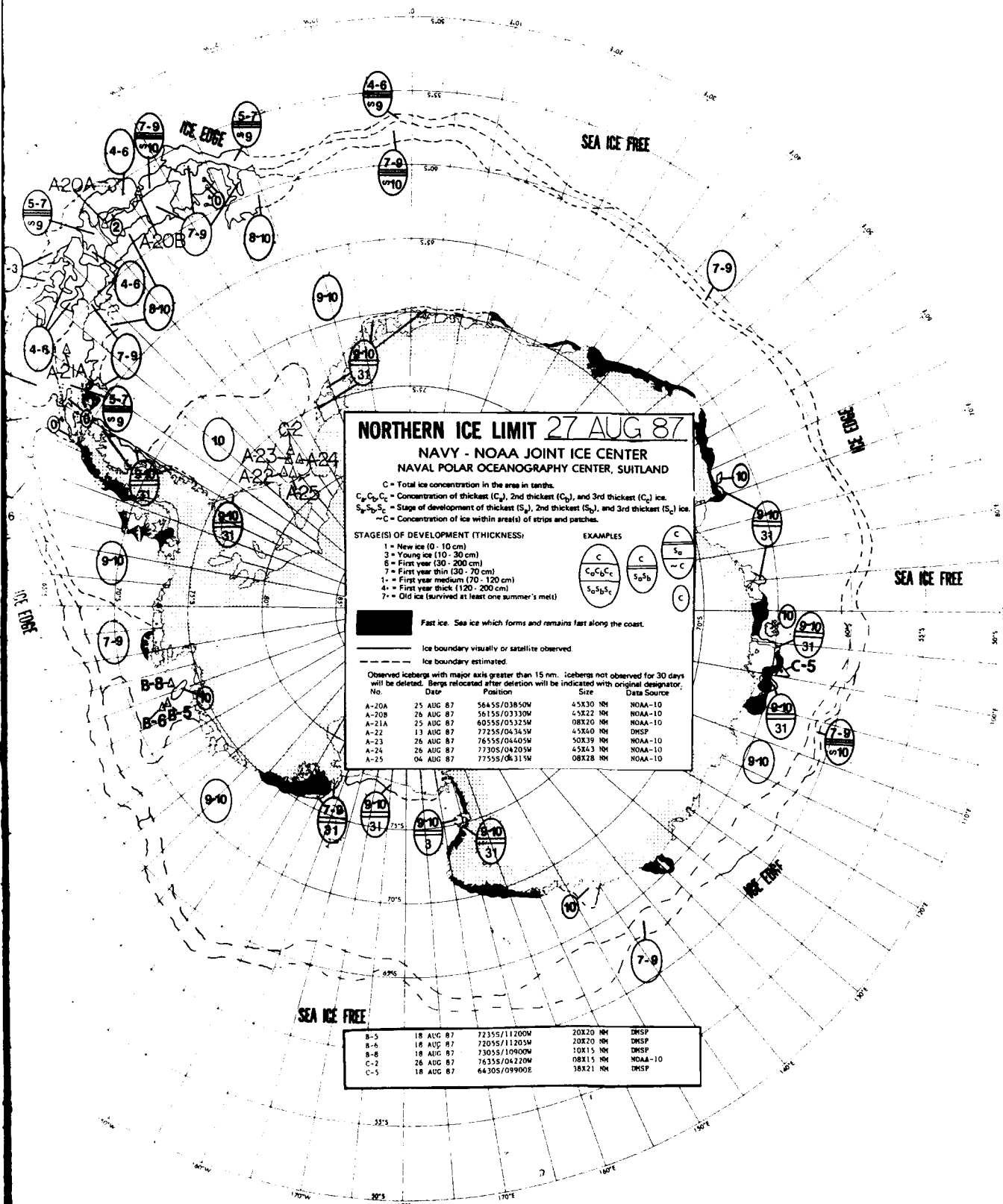
Fast ice. See ice which forms and remains fast along the coast.

Ice boundary visually or satellite observed
Ice boundary estimated

Observed icebergs with major axis greater than 15 nm. Icebergs not observed for 30 days will be deleted. Bergs relocated after deletion will be indicated with original designator, No.

No.	Date	Position	Size	Data Source
A-20A	25 AUG 87	54455/03850W	45830 NM	NOAA-10
A-20B	26 AUG 87	56155/03330W	45822 NM	NOAA-10
A-21A	25 AUG 87	60555/05325W	08820 NM	NOAA-10
A-22	13 AUG 87	72255/04345W	45840 NM	DMSP
A-23	26 AUG 87	76555/04405W	50839 NM	NOAA-10
A-24	26 AUG 87	77305/04205W	45843 NM	NOAA-10
A-25	04 AUG 87	77555/04315W	08828 NM	NOAA-10

B-5	18 AUG 87	72355/11200W	20820 NM	DMSP
B-6	18 AUG 87	72055/11205W	20820 NM	DMSP
B-8	18 AUG 87	71055/10900W	10815 NM	DMSP
C-2	26 AUG 87	76355/04220W	08815 NM	NOAA-10
C-5	18 AUG 87	64305/09400E	18821 NM	DMSP



NORTHERN ICE LIMIT 27 AUG 87

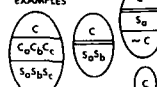
NAVY - NOAA JOINT ICE CENTER
NAVAL POLAR OCEANOGRAPHY CENTER, SUITLAND

C = Total ice concentration in the area in tenths.
C₁, C₂, C₃ = Concentration of thickest (C₁), 2nd thickest (C₂), and 3rd thickest (C₃) ice.
S₁, S₂, S₃ = Stage of development of thickest (S₁), 2nd thickest (S₂), and 3rd thickest (S₃) ice.
-C = Concentration of ice within area(s) of strips and patches.

STAGES OF DEVELOPMENT (THICKNESS)

- 1 = New ice (0 - 10 cm)
- 3 = Young ice (10 - 30 cm)
- 6 = First year thin (30 - 70 cm)
- 7 = First year thin (30 - 70 cm)
- 1 = First year medium (70 - 120 cm)
- 4 = First year thick (120 - 200 cm)
- 7 = Old ice (survived at least one summer's melt)

EXAMPLES



Fast ice. Sea ice which forms and remains fast along the coast.

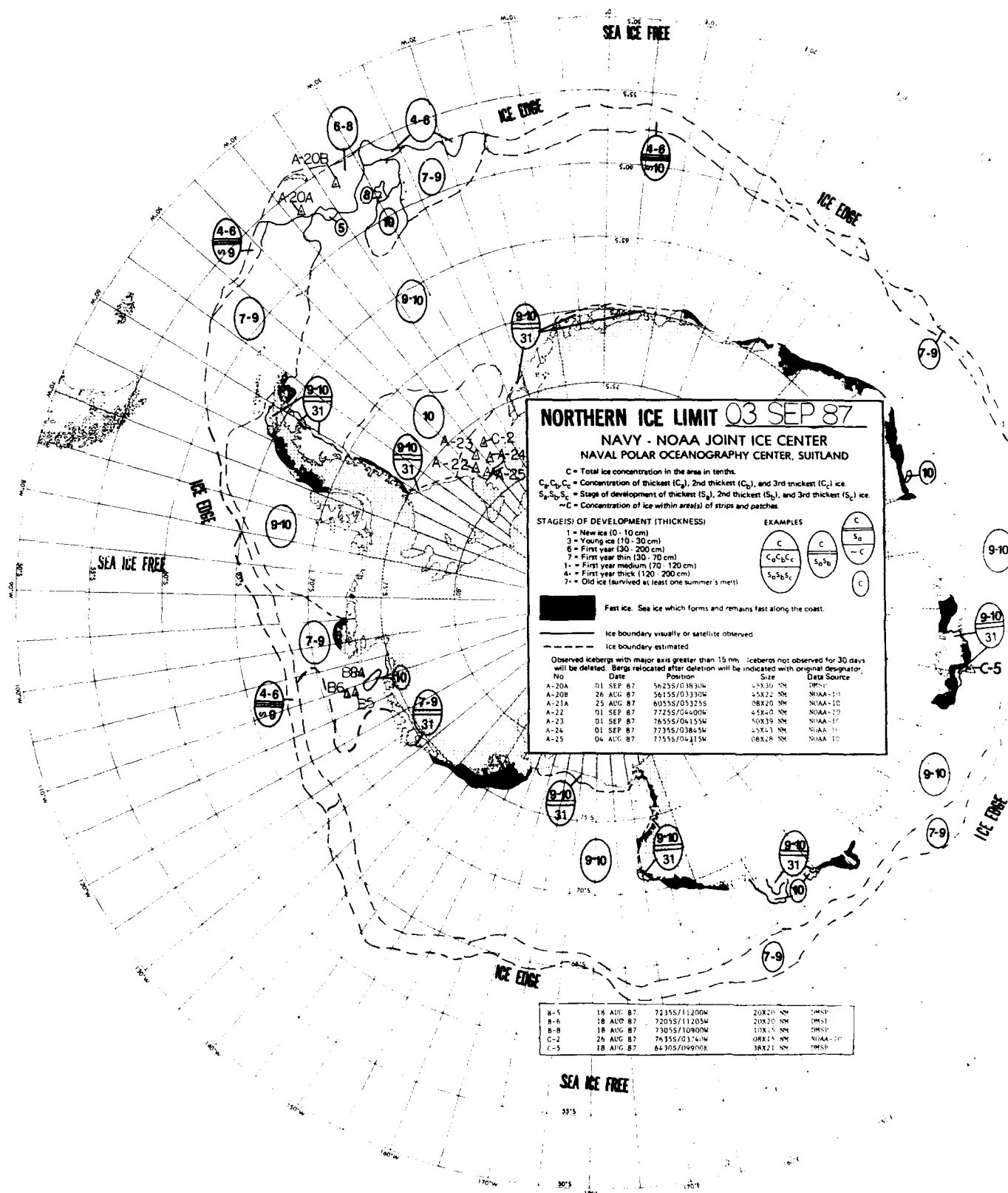
Ice boundary visually or satellite observed

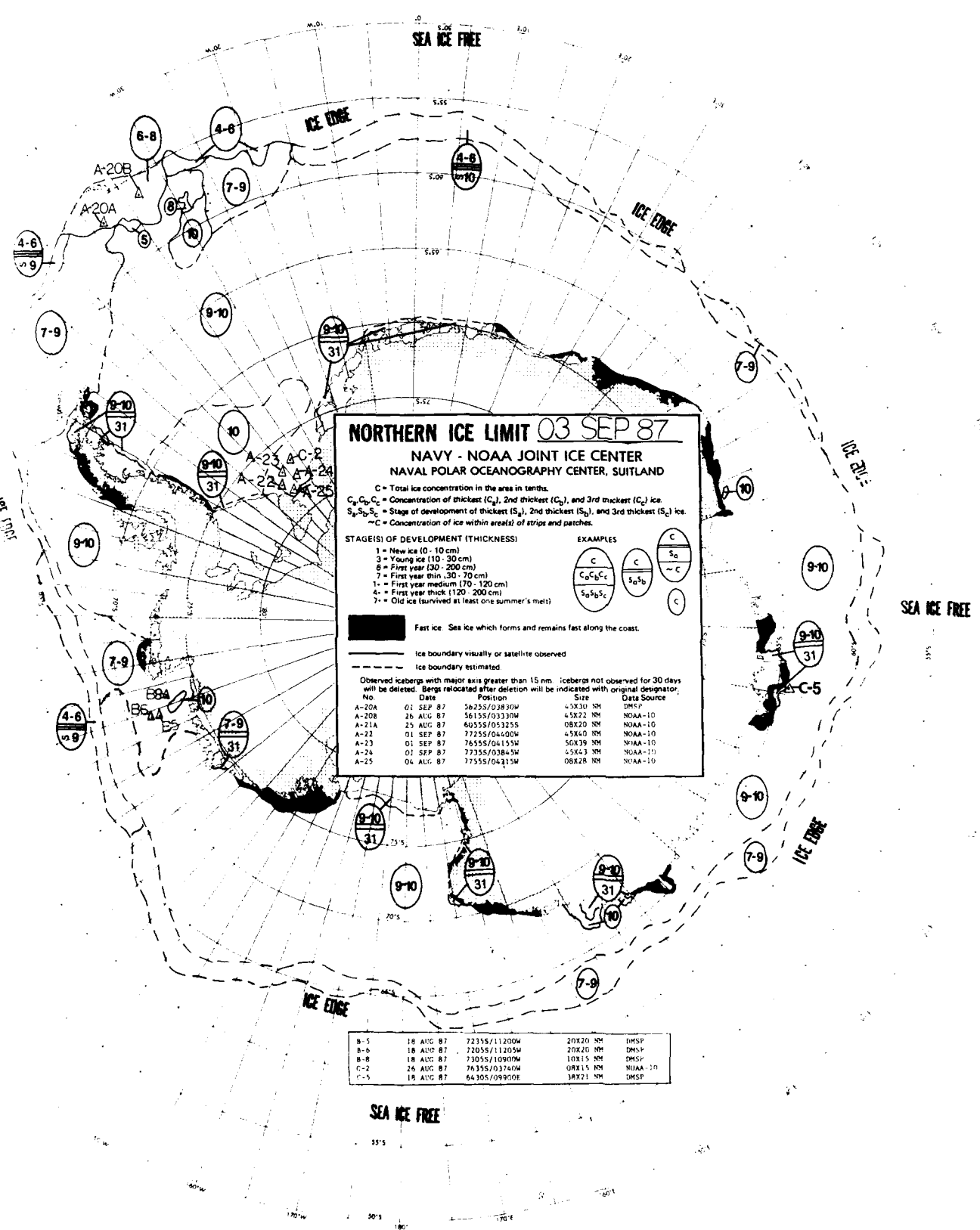
Ice boundary estimated

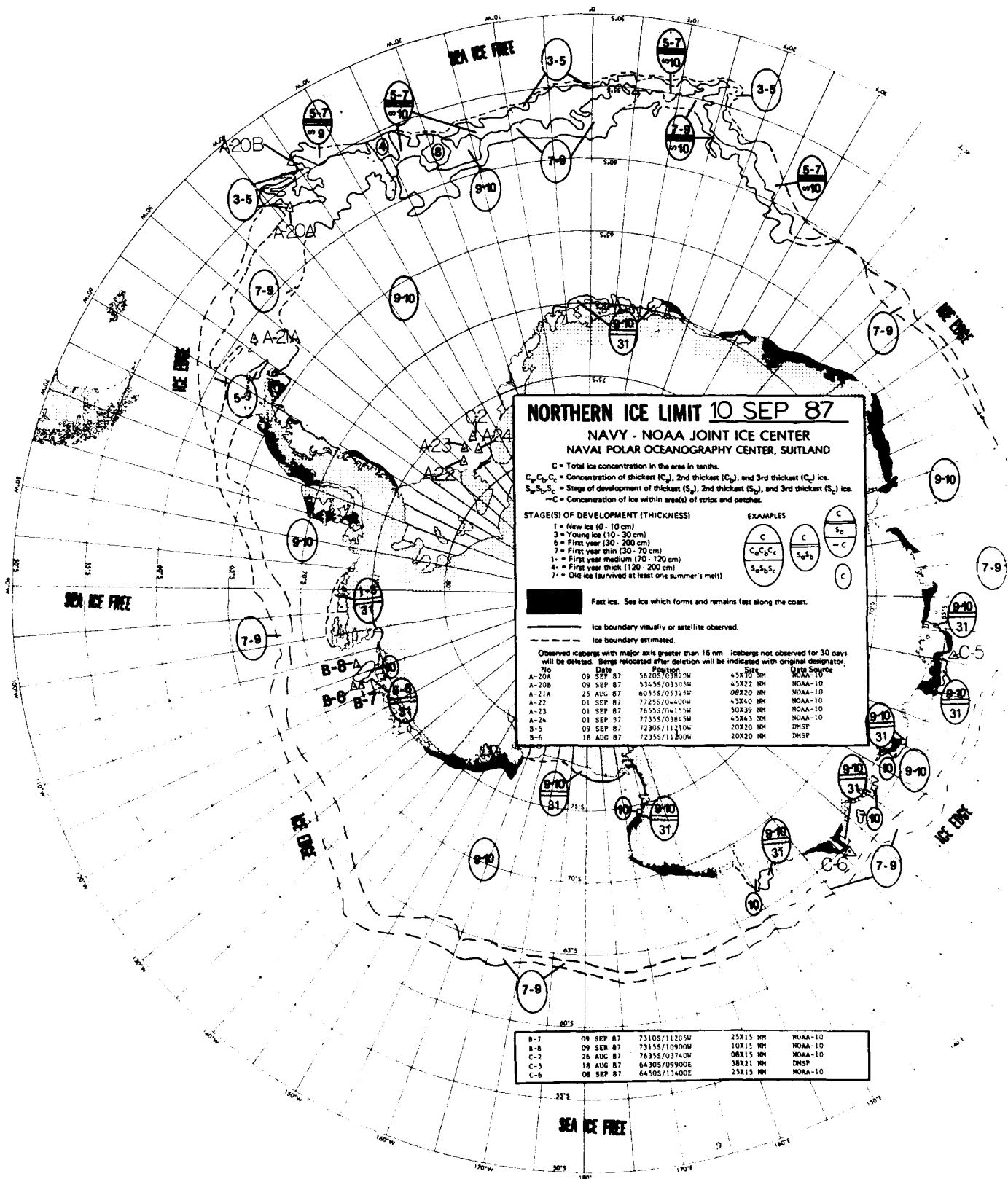
Observed icebergs with major axis greater than 15 nm. Icebergs not observed for 30 days will be deleted. Berge relocated after deletion will be indicated with original designator.

No.	Date	Position	Size	Data Source
A-20A	25 AUG 87	56455/03850W	45X30 NM	NOAA-10
A-20B	26 AUG 87	56155/03330W	45X22 NM	NOAA-10
A-21A	25 AUG 87	60555/05325W	08X20 NM	NOAA-10
A-22	13 AUG 87	72355/04345W	45X40 NM	DRSP
A-23	26 AUG 87	76555/04405W	50X39 NM	NOAA-10
A-24	26 AUG 87	77305/04205W	45X43 NM	NOAA-10
A-25	04 AUG 87	77555/06315W	08X28 NM	NOAA-10

B-5	18 AUG 87	72355/11200W	20X20 NM	DRSP
B-6	18 AUG 87	72055/11205W	20X20 NM	DRSP
B-8	18 AUG 87	73055/10900W	10X15 NM	DRSP
C-2	26 AUG 87	76355/04220W	08X15 NM	NOAA-10
C-5	18 AUG 87	64305/09900E	38X21 NM	DRSP







NORTHERN ICE LIMIT 10 SEP 87

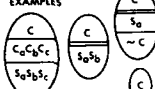
NAVY - NOAA JOINT ICE CENTER
NAVAL POLAR OCEANOGRAPHY CENTER, SUITLAND

C = Total ice concentration in the area in tenths.
C₁C₂C₃ = Concentration of thickest (C₁), 2nd thickest (C₂), and 3rd thickest (C₃) ice.
S₁S₂S₃ = Stage of development of thickest (S₁), 2nd thickest (S₂), and 3rd thickest (S₃) ice.
~C = Concentration of ice within area(s) of strips and patches.

STAGE(S) OF DEVELOPMENT (THICKNESS)

- 1 = New ice (0 - 10 cm)
- 3 = Young ice (10 - 30 cm)
- 6 = First year (30 - 200 cm)
- 7 = First year thin (30 - 70 cm)
- 1 = First year medium (70 - 120 cm)
- 4 = First year thick (120 - 200 cm)
- 7 = Old ice (survived at least one summer's melt)

EXAMPLES



Fast ice. See ice which forms and remains fast along the coast.

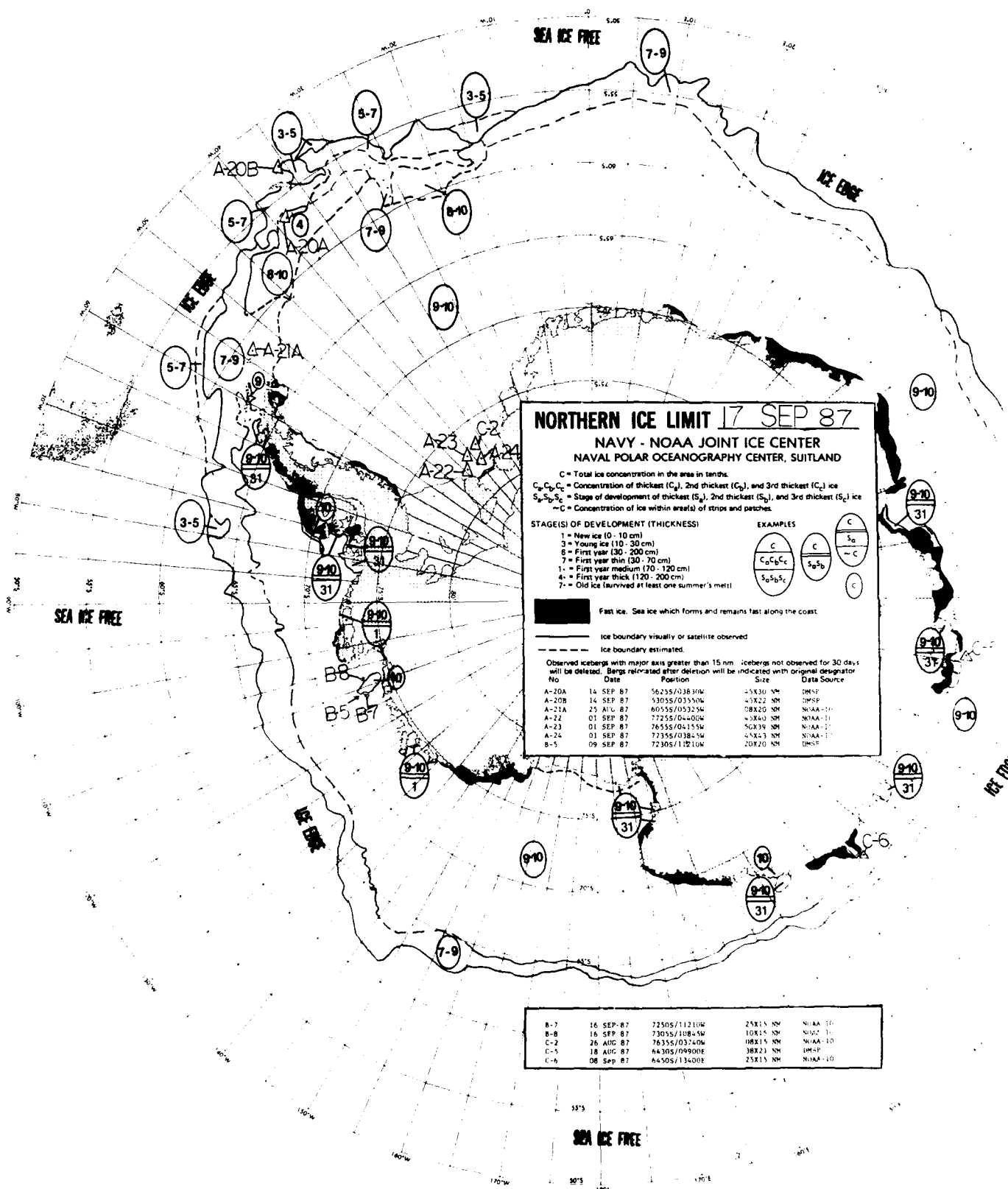
Ice boundary visually or satellite observed.

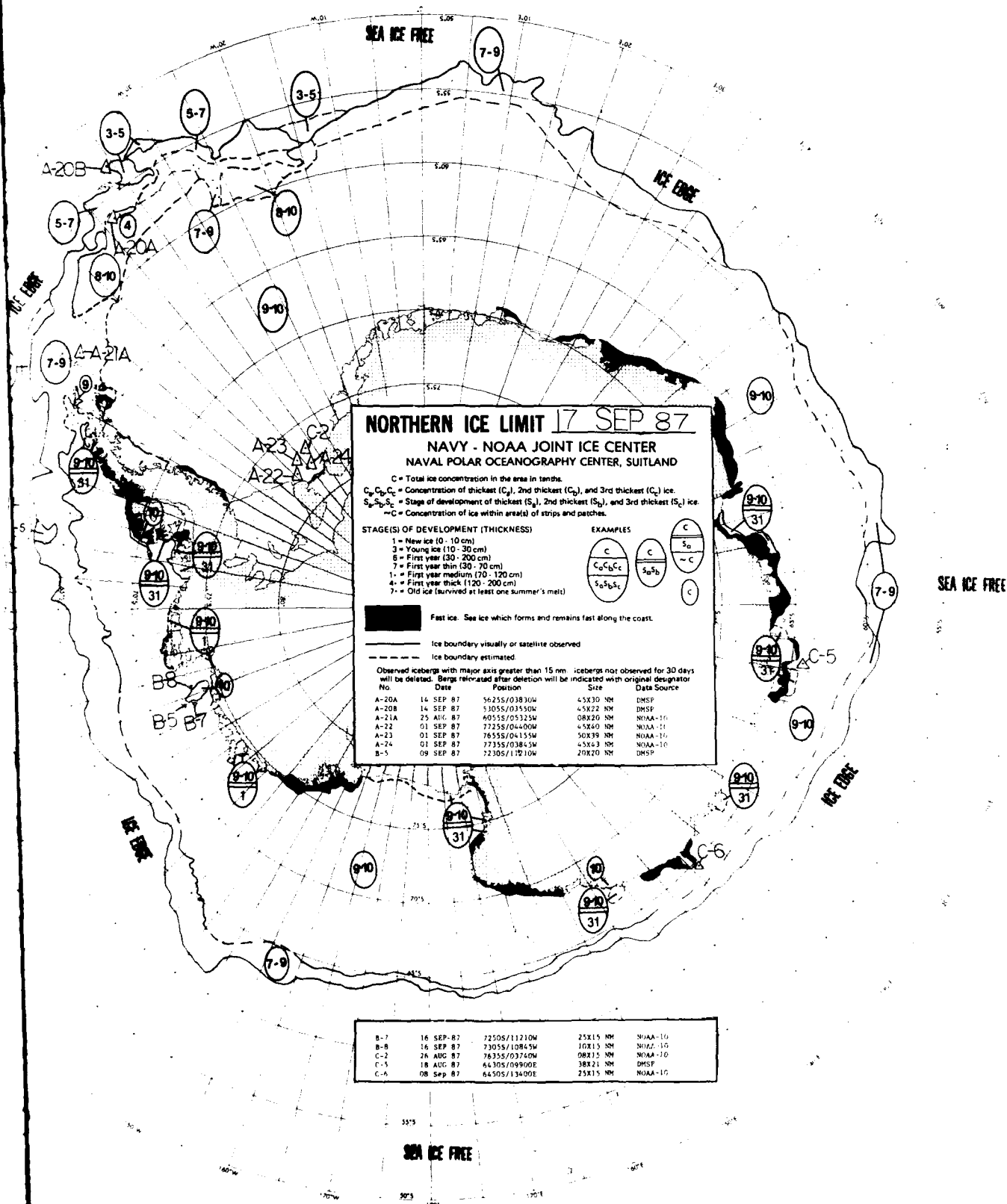
Ice boundary estimated.

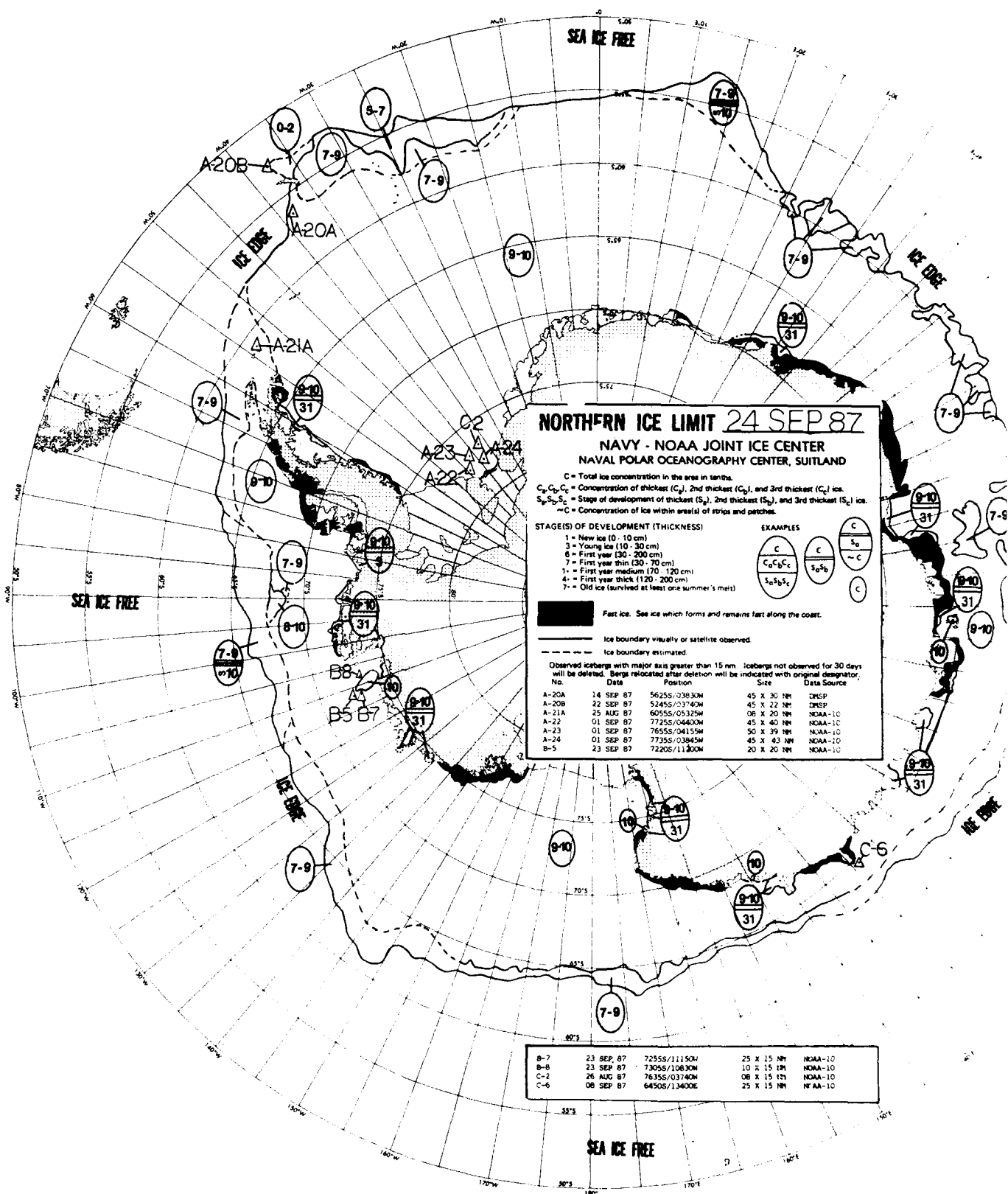
Observed icebergs with major axis greater than 15 nm. Icebergs not observed for 30 days will be deleted. Berge relocated after deletion will be indicated with original designator.

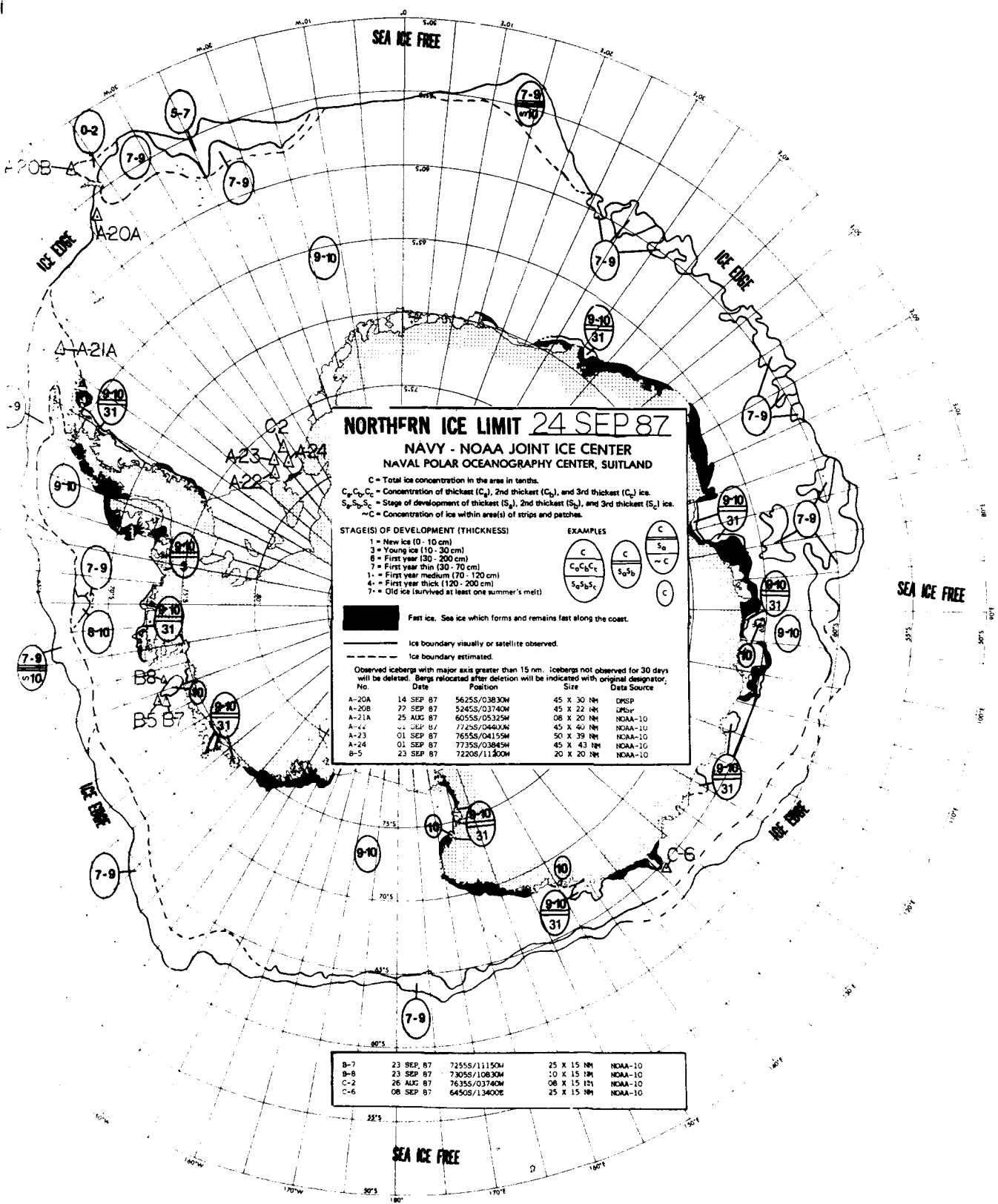
No.	Date	Position	Size	Origin
A-20A	09 SEP 87	5620S/03820W	45X30 NM	NOAA-10
A-20B	09 SEP 87	5345S/03505W	45X22 NM	NOAA-10
A-21A	25 AUG 87	6055S/03325W	08X20 NM	NOAA-10
A-22	01 SEP 87	7725S/04400W	45X40 NM	NOAA-10
A-23	01 SEP 87	7655S/04155W	50X39 NM	NOAA-10
A-24	01 SEP 87	7735S/03845W	45X43 NM	NOAA-10
B-5	09 SEP 87	7230S/11310W	20X20 NM	DMSP
B-6	18 AUG 87	7235S/11300W	20X20 NM	DMSP

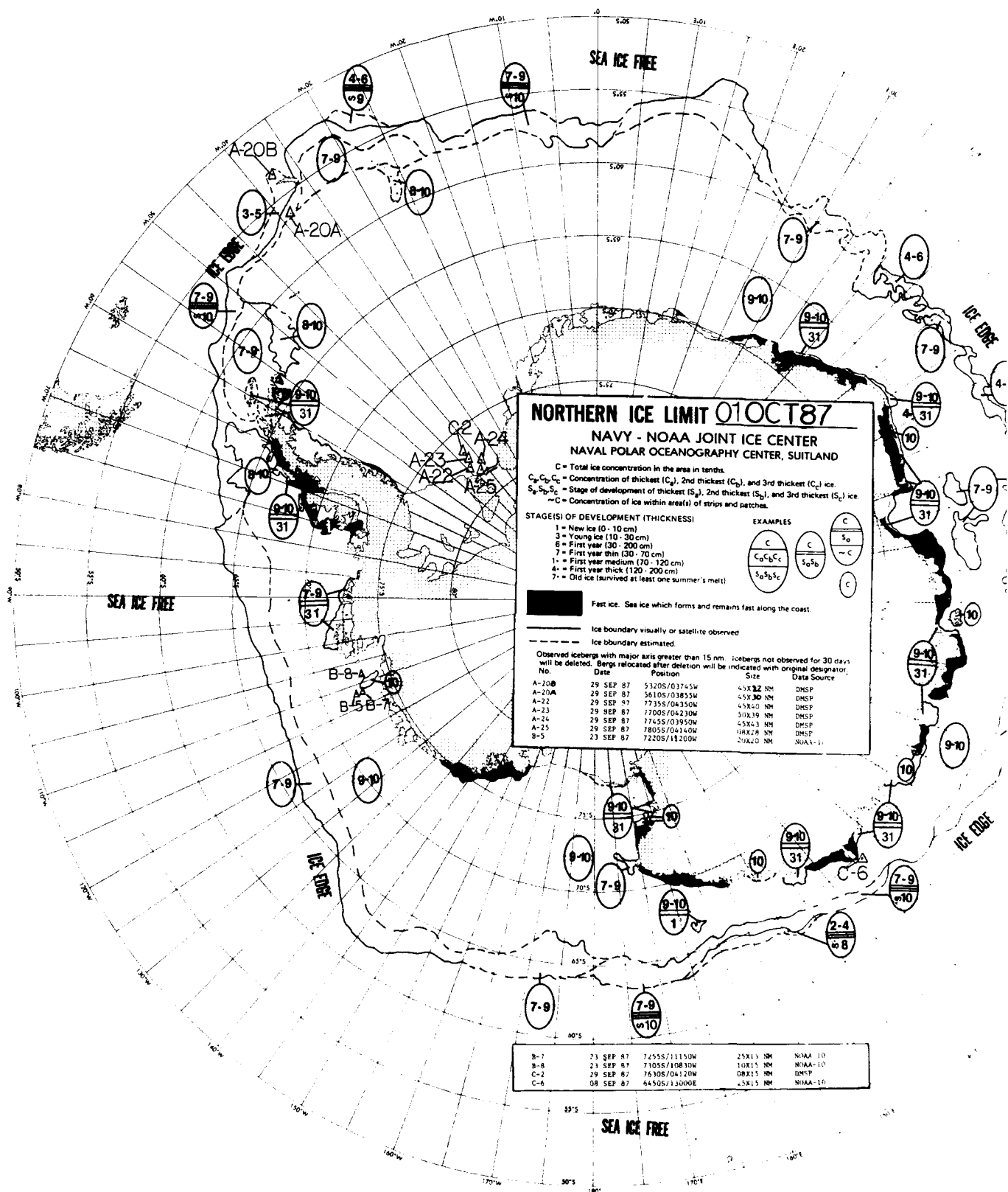
B-7	09 SEP 87	7310S/11205W	25X15 NM	NOAA-10
B-8	09 SEP 87	7315S/10900W	10X15 NM	NOAA-10
C-2	26 AUG 87	7635S/03740W	08X15 NM	NOAA-10
C-5	18 AUG 87	6430S/09900E	38X21 NM	DMSP
C-6	08 SEP 87	6450S/13400E	25X15 NM	NOAA-10

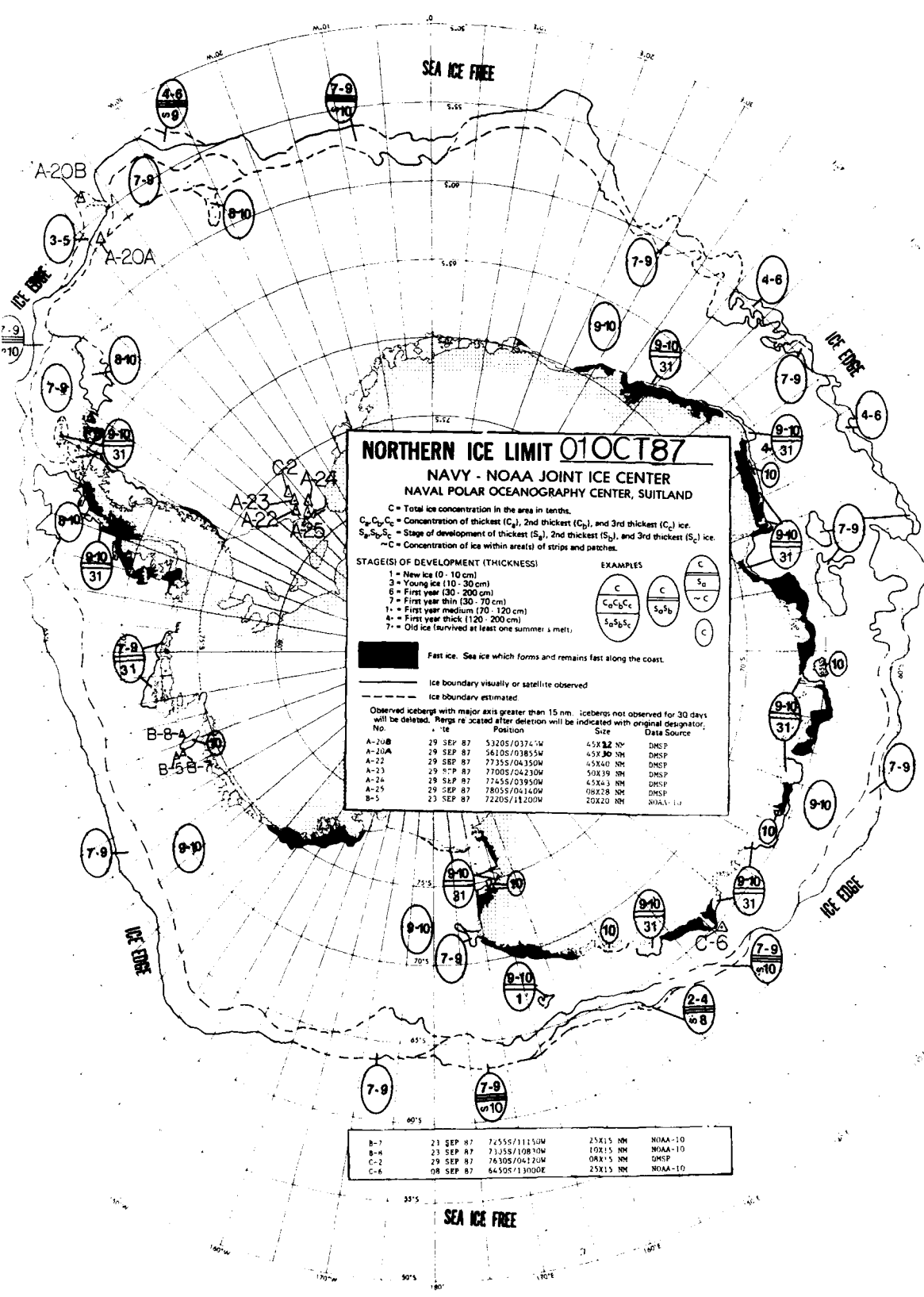












NORTHERN ICE LIMIT 01 OCT 87

NAVY - NOAA JOINT ICE CENTER
NAVAL POLAR OCEANOGRAPHY CENTER, SUITLAND

C = Total ice concentration in the area in tenths.
 C₁C₂C₃ = Concentration of thickest (C₁), 2nd thickest (C₂), and 3rd thickest (C₃) ice.
 S₁S₂S₃ = Stage of development of thickest (S₁), 2nd thickest (S₂), and 3rd thickest (S₃) ice.
 ~C = Concentration of ice within area(s) of strips and patches.

STAGE(S) OF DEVELOPMENT (THICKNESS)

- 1 = New ice (0 - 10 cm)
- 2 = Young ice (10 - 30 cm)
- 3 = First year (30 - 200 cm)
- 4 = First year thin (30 - 70 cm)
- 5 = First year medium (70 - 120 cm)
- 6 = First year thick (120 - 200 cm)
- 7 = Old ice (survived at least one summer melt)

EXAMPLES

C	C	C
C ₁ C ₂ C ₃	S ₁ S ₂ S ₃	~C
S ₁ S ₂ S ₃	C	C

Fast ice. Sea ice which forms and remains fast along the coast.

— Ice boundary visually or satellite observed
 --- Ice boundary estimated

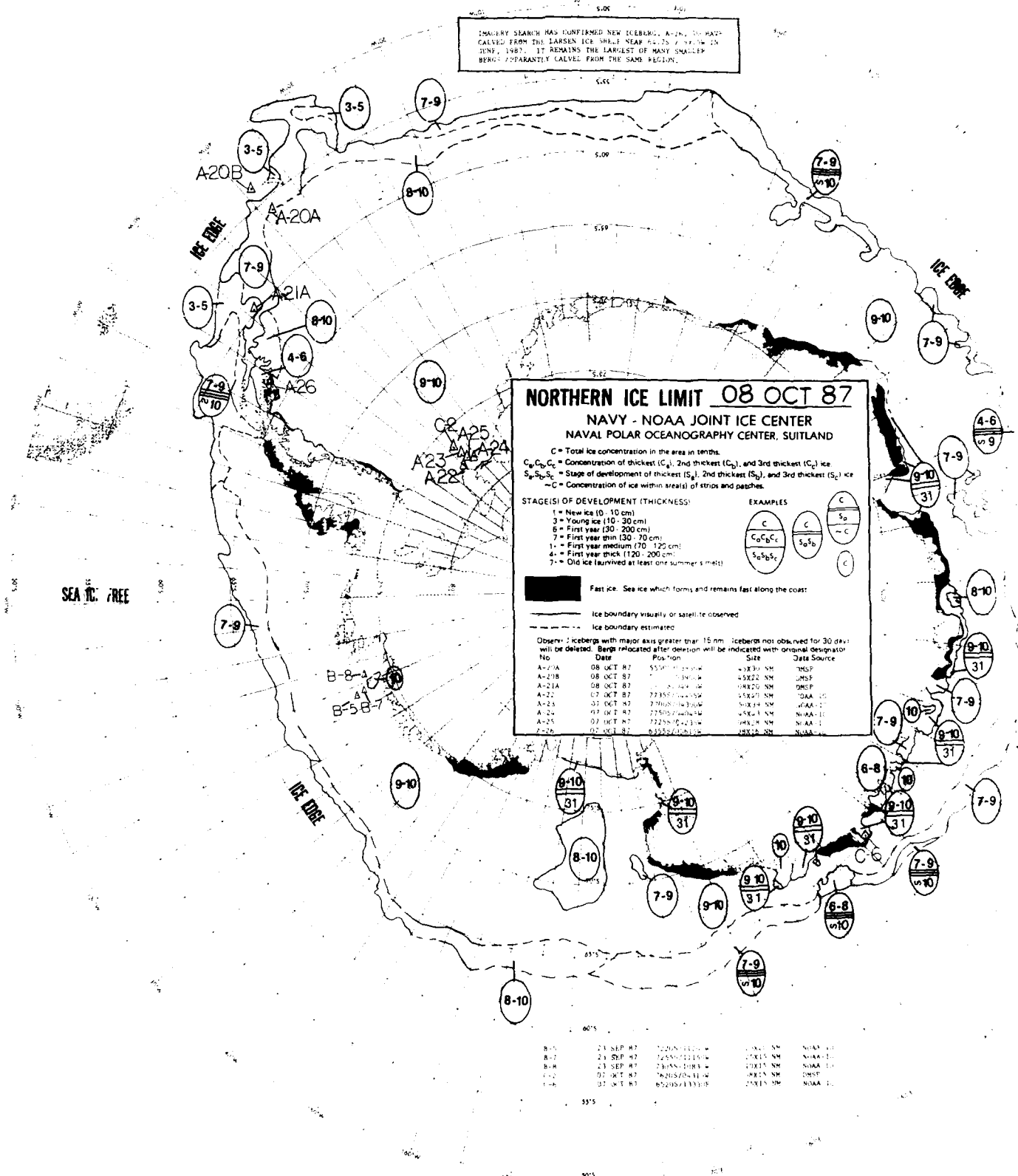
Observed icebergs with major axis greater than 15 nm. Icebergs not observed for 30 days will be deleted. Bergs re-located after deletion will be indicated with original designator.

No.	Date	Position	Size	Source
A-20B	29 SEP 87	5320S/0174W	45X32 NM	DMSP
A-20A	29 SEP 87	5410S/0385W	45X30 NM	DMSP
A-22	29 SEP 87	7735S/0425W	45X40 NM	DMSP
A-23	29 SEP 87	7700S/0423W	50X39 NM	DMSP
A-24	29 SEP 87	7745S/0395W	45X43 NM	DMSP
A-25	29 SEP 87	7805S/0414W	08X28 NM	DMSP
B-5	23 SEP 87	7220S/1120W	20X20 NM	TOTAL-11

B-7	21 SEP 87	7255S/1115W	25X15 NM	NOAA-10
B-8	23 SEP 87	7325S/1081W	10X15 NM	NOAA-10
C-2	29 SEP 87	7630S/0412W	08X15 NM	DMSP
C-6	08 SEP 87	6450S/1300E	25X15 NM	NOAA-10

SEA ICE FREE

IMAGERY SEARCH HAS CONFIRMED NEW ICEBERG, A-26, TO HAVE CALVED FROM THE LARSEN ICE SHELF NEAR 64°25'N 94°14'W IN JUNE, 1987. IT REMAINS THE LARGEST OF MANY SMALLER BERGS APPARENTLY CALVED FROM THE SAME REGION.



NORTHERN ICE LIMIT 08 OCT 87

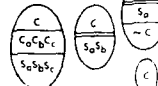
NAVY - NOAA JOINT ICE CENTER
NAVAL POLAR OCEANOGRAPHY CENTER, SUITLAND

C = Total ice concentration in the area in tenths.
C₁C₂C₃ = Concentration of thickest (C₁), 2nd thickest (C₂), and 3rd thickest (C₃) ice.
S₁S₂S₃ = Stage of development of thickest (S₁), 2nd thickest (S₂), and 3rd thickest (S₃) ice.
-C = Concentration of ice within areas of strips and patches.

STAGE(S) OF DEVELOPMENT (THICKNESS)

- 1 = New ice (0 - 10 cm)
- 2 = Young ice (10 - 30 cm)
- 3 = First year (30 - 200 cm)
- 4 = First year thin (30 - 70 cm)
- 5 = First year medium (70 - 120 cm)
- 6 = First year thick (120 - 200 cm)
- 7 = Old ice (survived at least one summer's melt)

EXAMPLES



Fast ice: Sea ice which forms and remains fast along the coast.
Ice boundary visually or satellite observed.
Ice boundary estimated.

Observed: Icebergs with major axis greater than 15 nm. Icebergs not observed for 30 days will be deleted. Bergs relocated after deletion will be indicated with original designator.

No.	Date	Position	Size	Age	Source
A-27A	08 OCT 87	55°00'N 120°00'W	43X30 NM	DNBP	
A-21B	08 OCT 87	73°00'N 140°00'W	45X22 NM	DNBP	
A-21A	08 OCT 87	73°00'N 140°00'W	45X22 NM	DNBP	
A-23	07 OCT 87	72°00'N 140°00'W	45X22 NM	DNBP	
A-24	07 OCT 87	72°00'N 140°00'W	45X22 NM	DNBP	
A-25	07 OCT 87	72°00'N 140°00'W	45X22 NM	DNBP	
A-26	07 OCT 87	64°25'N 94°14'W	45X22 NM	DNBP	

B-5	23 SEP 87	72°00'N 140°00'W	45X22 NM	NOAA-11
B-7	23 SEP 87	72°00'N 140°00'W	45X22 NM	NOAA-11
B-8	23 SEP 87	72°00'N 140°00'W	45X22 NM	NOAA-11
B-9	01 OCT 87	72°00'N 140°00'W	45X22 NM	DNBP
B-10	01 OCT 87	72°00'N 140°00'W	45X22 NM	NOAA-11

IMAGERY SEARCH HAS CONFIRMED NEW ICEBERG, A-26, TO HAVE CALVED FROM THE LARSEN ICE SHELF NEAR 64.7S / 59.5W IN JUNE, 1987. IT REMAINS THE LARGEST OF MANY SMALLER BERGS APPARENTLY CALVED FROM THE SAME REGION.

NORTHERN ICE LIMIT 08 OCT 87

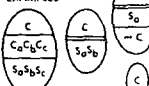
NAVY - NOAA JOINT ICE CENTER
NAVAL POLAR OCEANOGRAPHY CENTER, SUITLAND

C = Total ice concentration in the area in tenths.
C₁C₂C₃ = Concentration of thickest (C₁), 2nd thickest (C₂), and 3rd thickest (C₃) ice.
S₁S₂S₃ = Stage of development of thickest (S₁), 2nd thickest (S₂), and 3rd thickest (S₃) ice.
C = Concentration of ice within area(s) of rotas and patches.

STAGES OF DEVELOPMENT (THICKNESS)

- 1 = New ice (0 - 10 cm)
- 3 = Young ice (10 - 30 cm)
- 6 = First year (30 - 200 cm)
- 7 = First year thin (30 - 70 cm)
- 1 = First year medium (70 - 120 cm)
- 4 = First year thick (120 - 200 cm)
- 7 = Old ice (survived at least one summer's melt)

EXAMPLES



Fast ice: See ice which forms and remains fast along the coast

Ice boundary virtually or satellite observed

Ice boundary estimated

Observed icebergs with major axis greater than 15 nm. Icebergs not observed for 30 days will be deleted. Berge relocated after deletion will be indicated with original designator.

No	Date	Position	Size	Data Source
A-20A	08 OCT 87	5550S/03850W	45X30 NM	DMSP
A-20B	08 OCT 87	5350S/03900W	65X22 NM	DMSP
A-21A	08 OCT 87	5950S/04900W	08X20 NM	DMSP
A-22	07 OCT 87	7735S/04455W	45X40 NM	NOAA-10
A-23	07 OCT 87	7700S/04300W	50X30 NM	NOAA-10
A-24	07 OCT 87	7750S/04045W	65X43 NM	NOAA-10
A-25	07 OCT 87	7225S/04235W	08X20 NM	NOAA-10
A-26	07 OCT 87	6355S/02815W	08X16 NM	NOAA-10

B-5	23 SEP 87	7220S/1120W	20X20 NM	NOAA-10
B-7	13 SEP 87	7255S/11150W	25X15 NM	NOAA-10
B-8	23 SEP 87	7305S/10850W	10X15 NM	NOAA-10
C-2	07 OCT 87	7623S/04310W	08X15 NM	DMSP
C-6	07 OCT 87	6520S/11330E	25X15 NM	NOAA-10

SEA ICE FREE

NORTHERN ICE LIMIT 15 OCT 87
NAVY - NOAA JOINT ICE CENTER
NAVAL POLAR OCEANOGRAPHY CENTER, SUITLAND

C = Total ice concentration in the area in tenths.
 C_1, C_2, C_3 = Concentration of thickest (C_1), 2nd thickest (C_2), and 3rd thickest (C_3) ice.
 S_1, S_2, S_3 = Stage of development of thickest (S_1), 2nd thickest (S_2), and 3rd thickest (S_3) ice.
 ~C = Concentration of ice within area(s) of strips and patches.

STAGES OF DEVELOPMENT (THICKNESS)

- 1 = New ice (10 - 10 cm)
- 3 = Young ice (110 - 30 cm)
- 6 = First year (130 - 200 cm)
- 7 = First year thin (130 - 70 cm)
- 1 = First year medium (70 - 120 cm)
- 4 = First year thick (120 - 200 cm)
- 7 = Old ice (survived at least one summer's melt)

EXAMPLES

Fast ice: Sea ice which forms and remains fast along the coast.
 Ice boundary visually or satellite observed.
 Ice boundary estimated.

Observed icebergs with major axis greater than 15 nm. Icebergs not observed for 30 days will be deleted. Bergs relocated after deletion will be indicated with original designation.

No.	Date	Position	Size	Data Source
A-20A	13 OCT 87	5535S/02745W	45X30 NM	PMSP
A-20B	13 OCT 87	5340S/02955W	45X22 NM	OPF7
A-21A	14 OCT 87	5910S/04900W	38X60 NM	NA-11
A-22	09 OCT 87	7175S/04455W	45X40 NM	NA-11
A-23	09 OCT 87	7700S/04300W	50X31 NM	NA-11
A-24	09 OCT 87	7750S/04045W	45X43 NM	NA-11
A-25	09 OCT 87	7725S/06235W	08X25 NM	NA-11
A-26	07 OCT 87	6355S/05615W	08X12 NM	NA-11

ICEBERG DATA

No.	Date	Position	Size	Data Source
B-5	11 OCT 87	7220S/11200W	20X20 NM	NA-11
B-7	11 OCT 87	7255S/11210W	25X15 NM	NA-11
B-8	11 OCT 87	7305S/10930W	10X15 NM	NA-11
B-9	13 OCT 87	7810S/16125W	38X22 NM	NA-11
C-2	09 OCT 87	7620S/04110W	08X15 NM	NA-11
C-6	07 OCT 87	6520S/11130E	25X15 NM	NA-11

A MAJOR BREAK OF THE EASTERN ROSS ICE SHELF APPARENTLY OCCURRED BETWEEN 25 SEPT AND 13 OCT '87. FRACTURES CAN BE OBSERVED ON US OCT IMAGERY, BUT IT IS NOT CERTAIN SEPARATION WAS COMPLETE AT THAT TIME. MOVEMENT OF RESULTANT ICEBERG B-9 HAS BEEN APPROXIMATELY 45 NM WESTWARD.

A MAJOR BREAK OF THE EASTERN ROSS ICE SHELF APPARENTLY OCCURRED BETWEEN 25 SEPT AND 13 OCT '87. FRACTURES CAN BE OBSERVED ON US OCT IMAGERY, BUT IT IS NOT CERTAIN SEPARATION WAS COMPLETE AT THAT TIME. MOVEMENT OF RESULTANT ICEBERG B-9 HAS BEEN APPROXIMATELY 95 NM WESTWARD.

AFTER FURTHER IMAGERY SEARCH, NOW CONSIDER ORIGIN OF ICEBERGS A-21A AND A-26 AS UNCERTAIN. A-21, A 22X29 NM ICEBERG CALVED FROM THE LARGEST ICE SHELF JULY '86 AND WAS LAST OBSERVED AT 66455/059154N 16 DEC '86. A-21A AND/OR A-26 MAY BE REMNANTS OF A-21.

NORTHERN ICE LIMIT 15 OCT 87

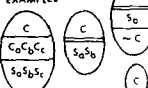
NAVY - NOAA JOINT ICE CENTER
NAVAL POLAR OCEANOGRAPHY CENTER, SUITLAND

C = Total ice concentration in the area in tenths.
C₁, C₂, C₃ = Concentration of thickest (C₁), 2nd thickest (C₂), and 3rd thickest (C₃) ice.
S₁, S₂, S₃ = Stage of development of thickest (S₁), 2nd thickest (S₂), and 3rd thickest (S₃) ice.
-C = Concentration of ice within area(s) of strips and patches.

STAGE(S) OF DEVELOPMENT (THICKNESS)

- 1 = New ice (0 - 10 cm)
- 3 = Young ice (10 - 30 cm)
- 8 = First year (30 - 200 cm)
- 7 = First year thin (30 - 70 cm)
- 1 = First year medium (70 - 120 cm)
- 4 = First year thick (120 - 200 cm)
- 7 = Old ice (survived at least one summer's melt)

EXAMPLES



Fast ice - Sea ice which forms and remains fast along the coast.

Ice boundary visually or satellite observed

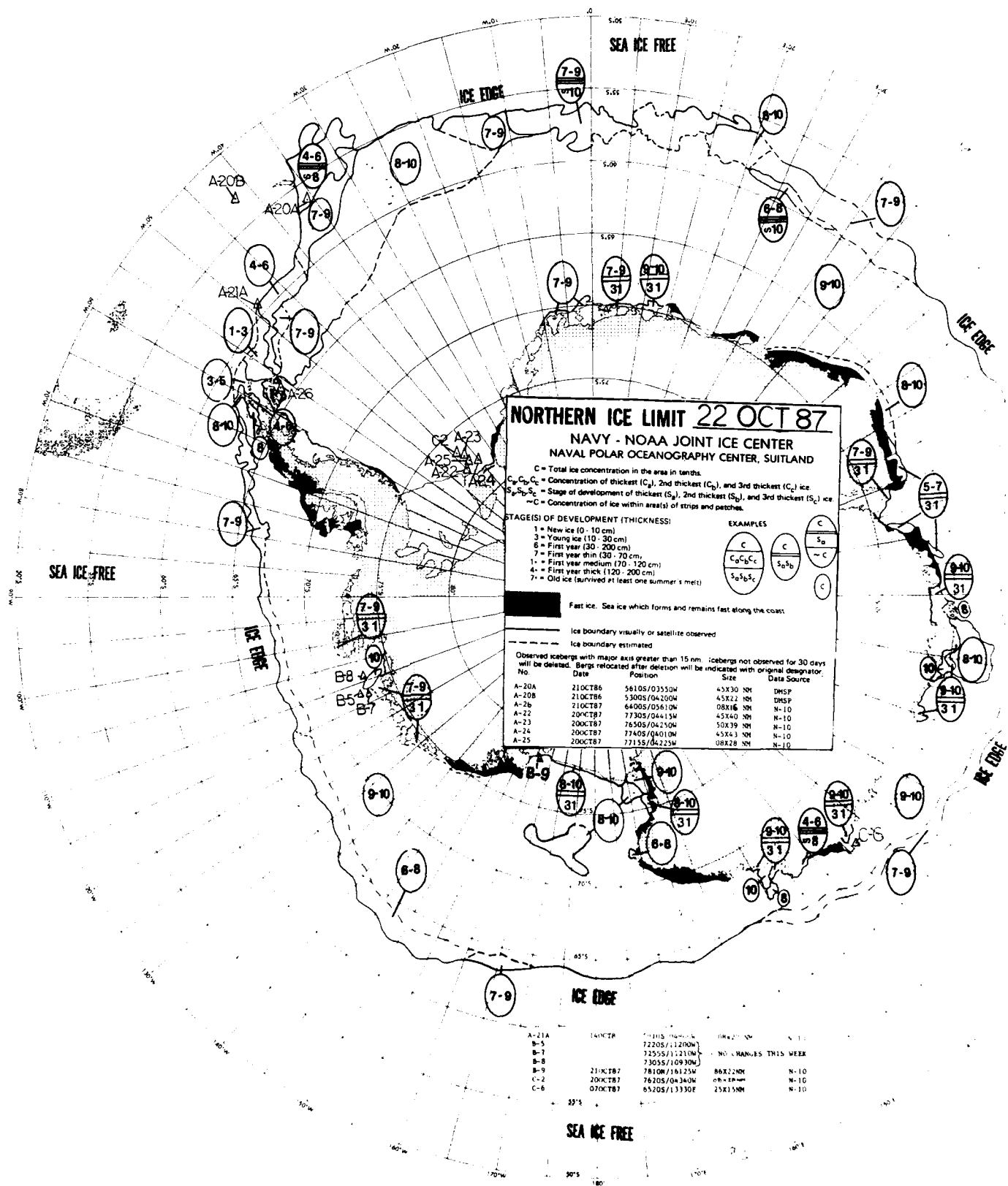
Ice boundary estimated

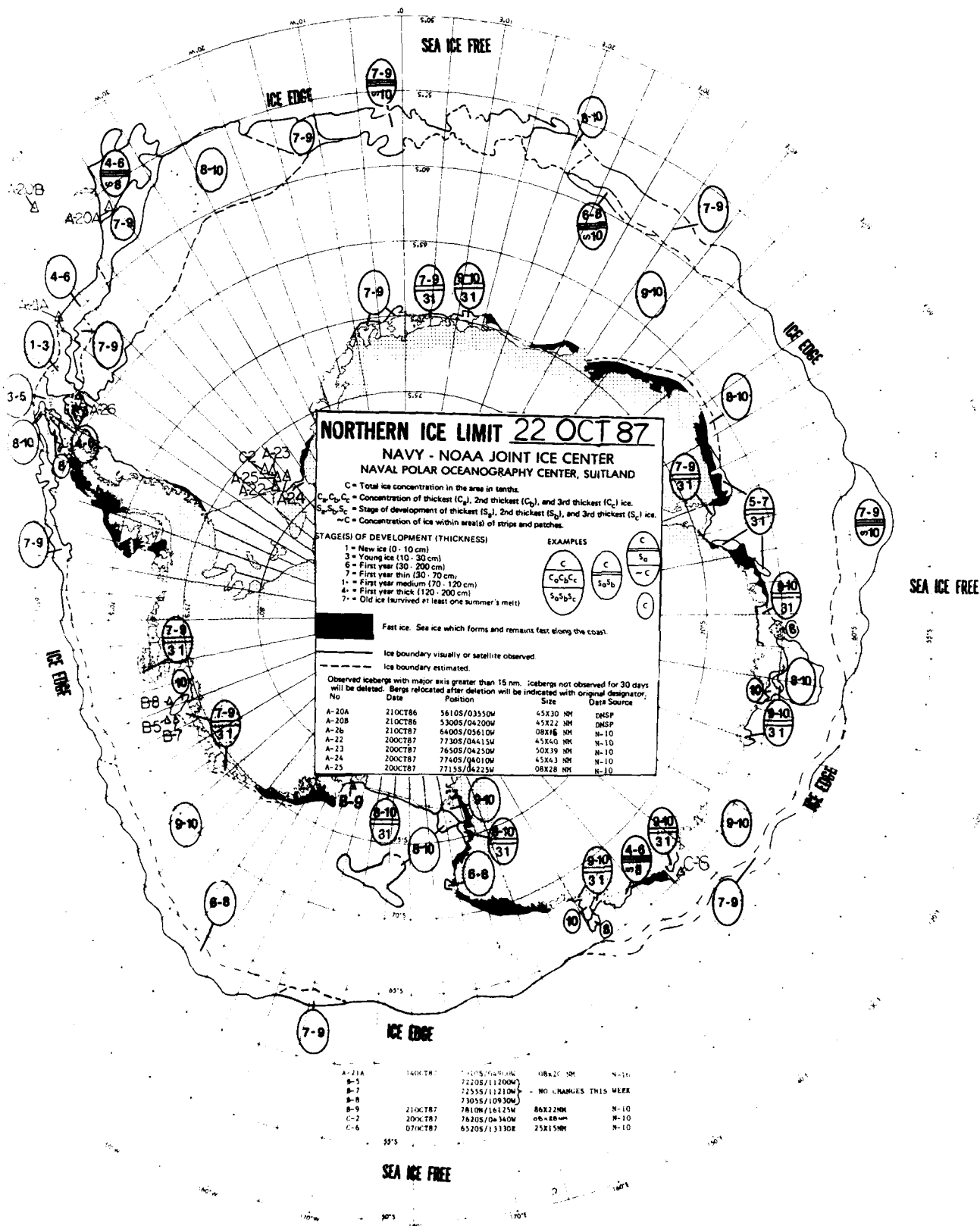
Observed icebergs with major axis greater than 15 nm. Icebergs not observed for 30 days will be deleted. Berge relocated after deletion will be indicated with original designator.

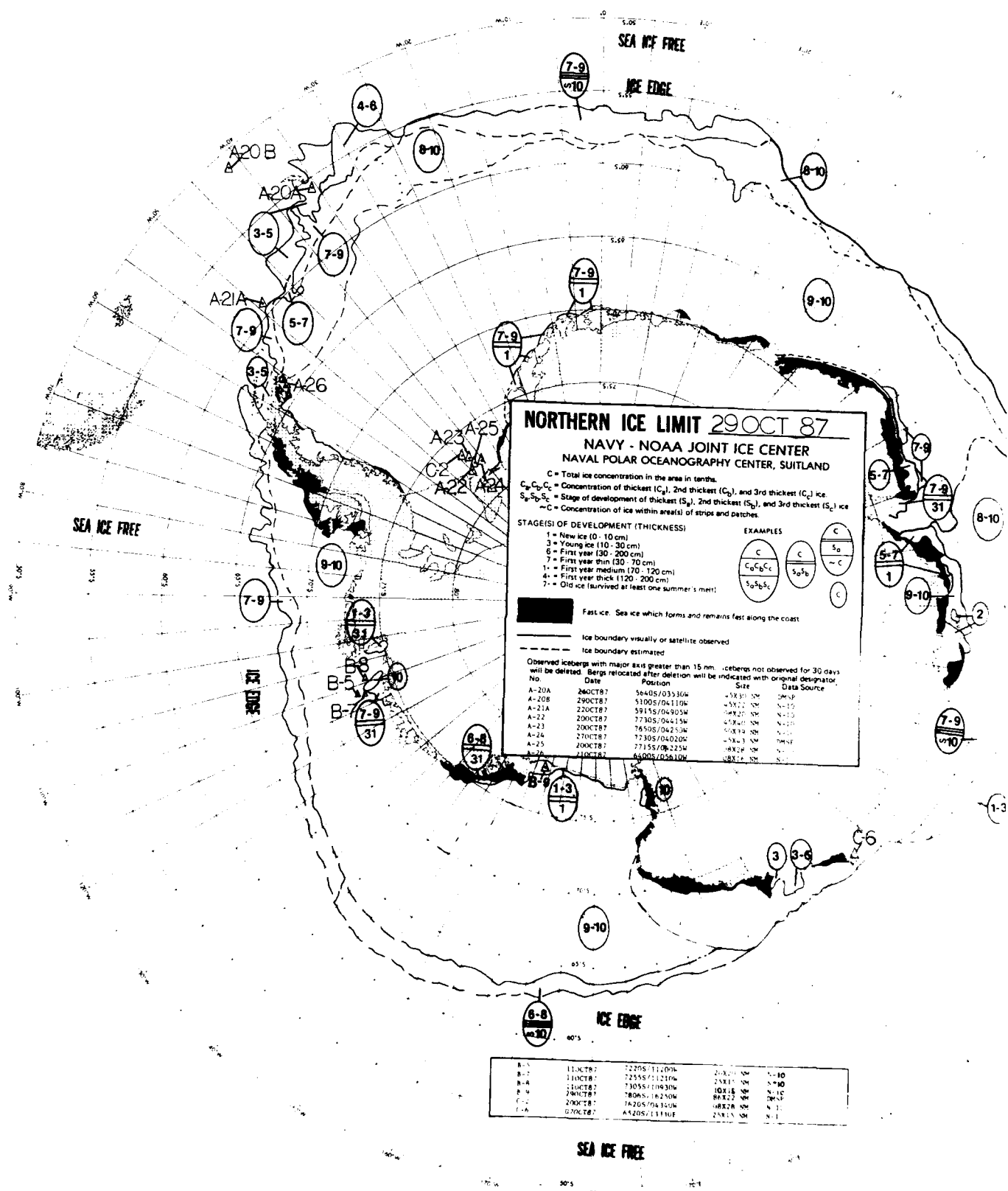
No.	Date	Position	Size	Data Source
A-20A	13 OCT 87	55355/03749W	45X30 NM	DMSP
A-20B	13 OCT 87	53405/03955W	45X22 NM	DMSP
A-21A	14 OCT 87	59105/04907W	08X20 NM	NKAA-10
A-22	09 OCT 87	77355/04455W	45X40 NM	NKAA-10
A-23	09 OCT 87	77005/04300W	50X39 NM	NKAA-10
A-24	09 OCT 87	77505/04045W	45X43 NM	NKAA-10
A-25	09 OCT 87	77255/04235W	08X08 NM	NKAA-10
A-26	07 OCT 87	61655/05615W	08X16 NM	NKAA-10

B-5	11 OCT 87	72205/11200W	20X20 NM	NKAA-10
B-7	11 OCT 87	72555/11210W	25X15 NM	NKAA-10
B-8	11 OCT 87	73055/10930W	10X15 NM	NKAA-10
B-9	11 OCT 87	78105/16125W	08X22 NM	NKAA-10
C-2	09 OCT 87	76205/04310W	28X15 NM	NKAA-10
C-6	17 OCT 87	65205/13330E	25X15 NM	NKAA-10

A MAJOR BREAK OF THE EASTERN RACK ICE SHELF APPARENTLY OCCURRED BETWEEN 25 SEP AND 13 OCT '87. FRACTURES CAN BE OBSERVED ON 25 OCT IMAGERY, BUT IT IS NOT CERTAIN SEPARATION WAS COMPLETE AT THAT TIME. MOVEMENT OF RESULTANT ICEBERG B-9 HAS BEEN APPROXIMATELY 05 NM WESTWARD.







NORTHERN ICE LIMIT 29 OCT 87

**NAVY - NOAA JOINT ICE CENTER
NAVAL POLAR OCEANOGRAPHY CENTER, SUITLAND**

C = Total ice concentration in the area in tenths.

C₁, C₂, C₃ = Concentration of thickest (C₁), 2nd thickest (C₂), and 3rd thickest (C₃) ice.

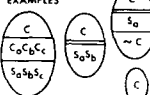
S₁, S₂, S₃ = Stage of development of thickest (S₁), 2nd thickest (S₂), and 3rd thickest (S₃) ice.

→ C = Concentration of ice within areas of strips and patches.

STAGE(S) OF DEVELOPMENT (THICKNESS)

- 1 = New ice (10 - 30 cm)
- 2 = Young ice (30 - 70 cm)
- 3 = First year thin (70 - 120 cm)
- 4 = First year medium (120 - 200 cm)
- 5 = First year thick (200 - 300 cm)
- 6 = Old ice (survived at least one summer's melt)

EXAMPLES



Fast ice - Sea ice which forms and remains fast along the coast

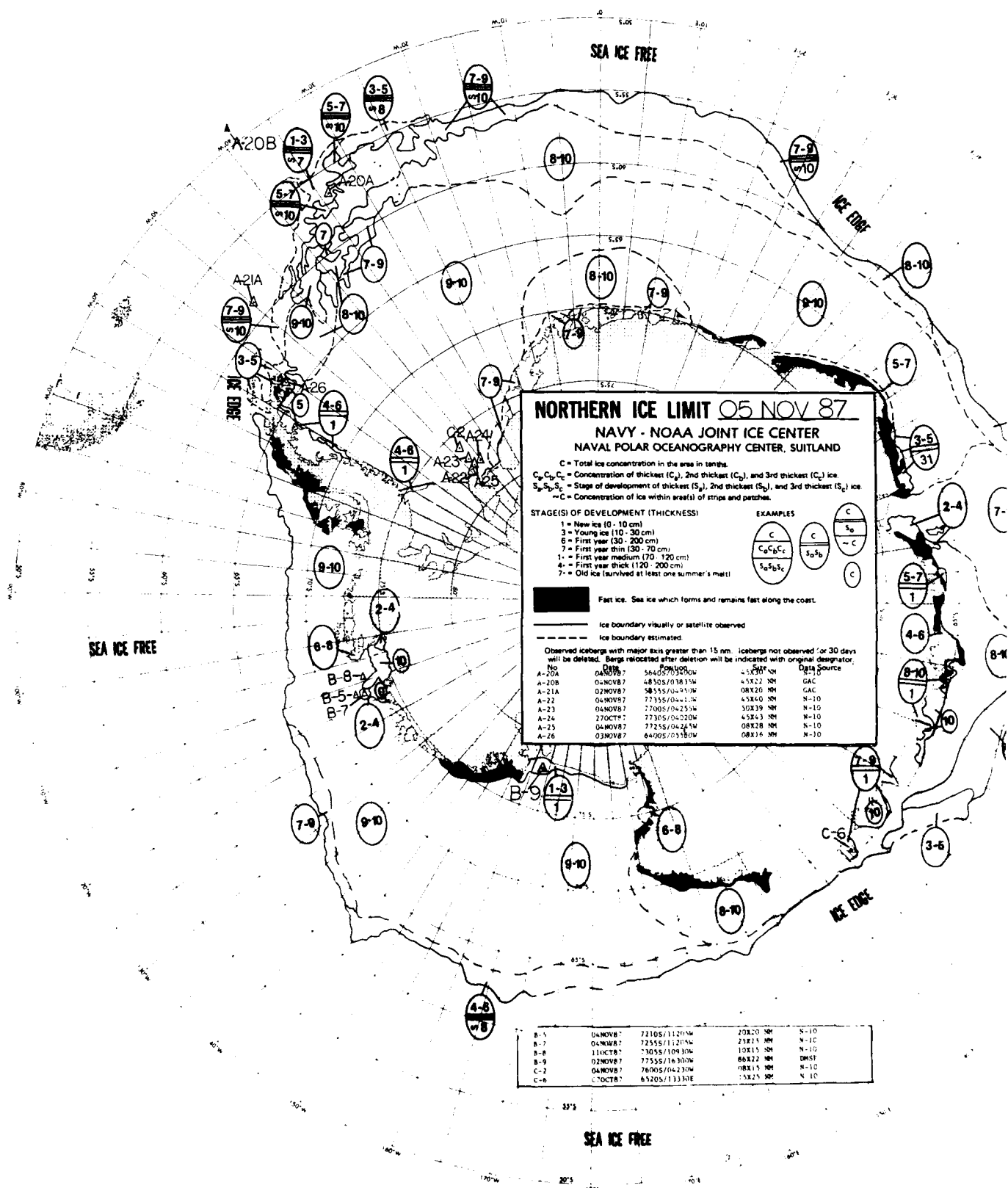
Ice boundary visually or satellite observed

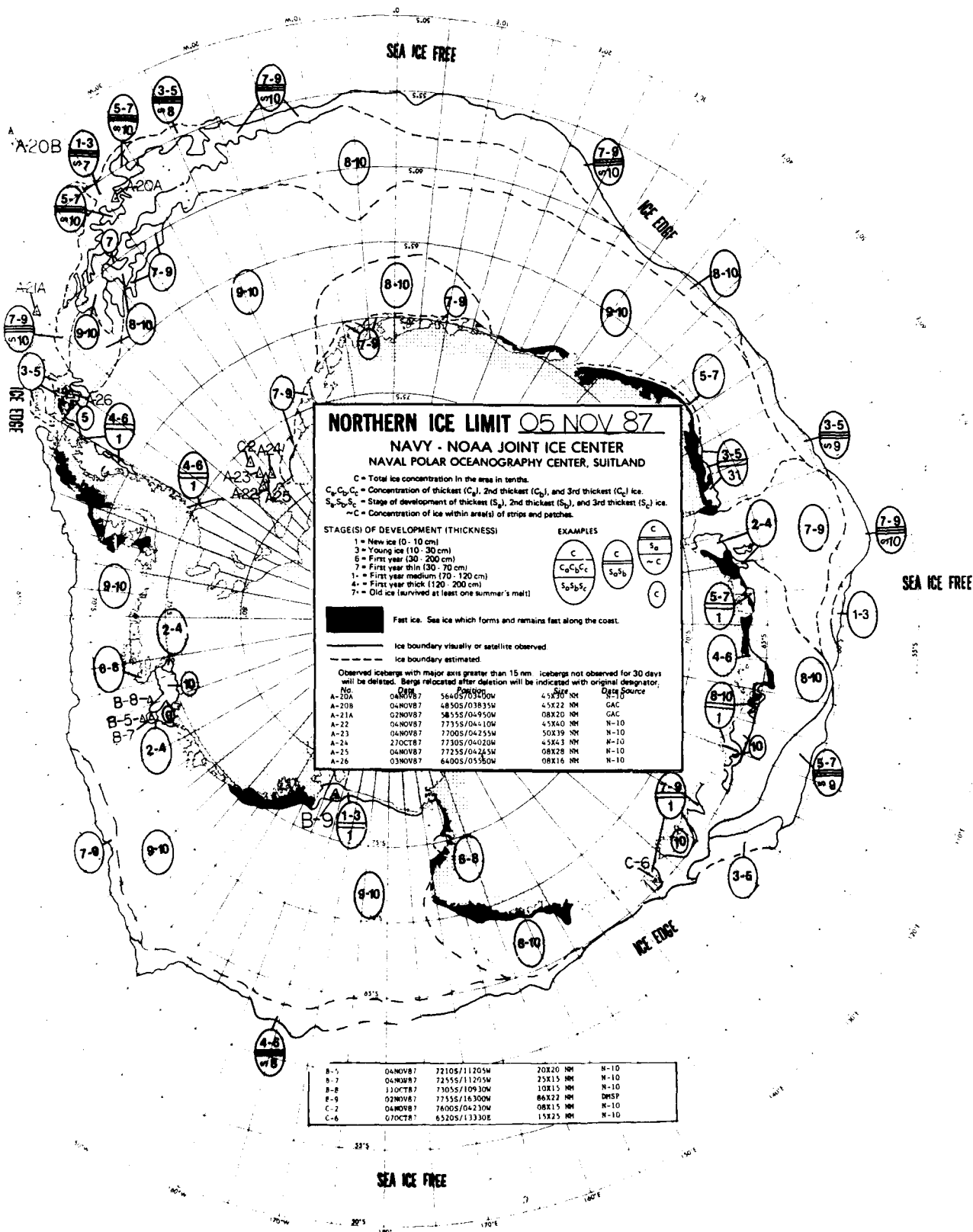
Ice boundary estimated

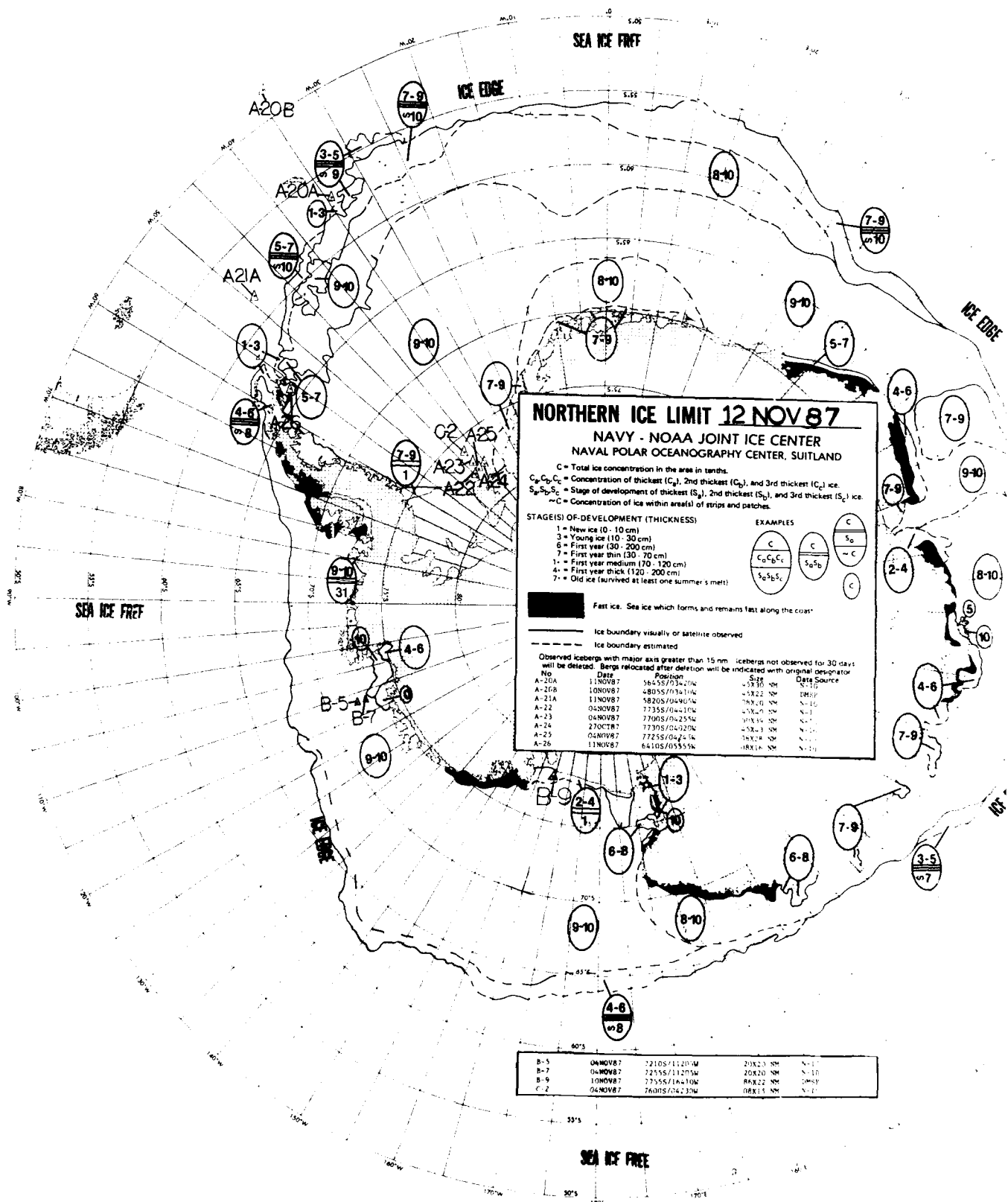
Observed icebergs with major axis greater than 15 nm. Icebergs not observed for 30 days will be deleted. Berge relocated after deletion will be indicated with original designator.

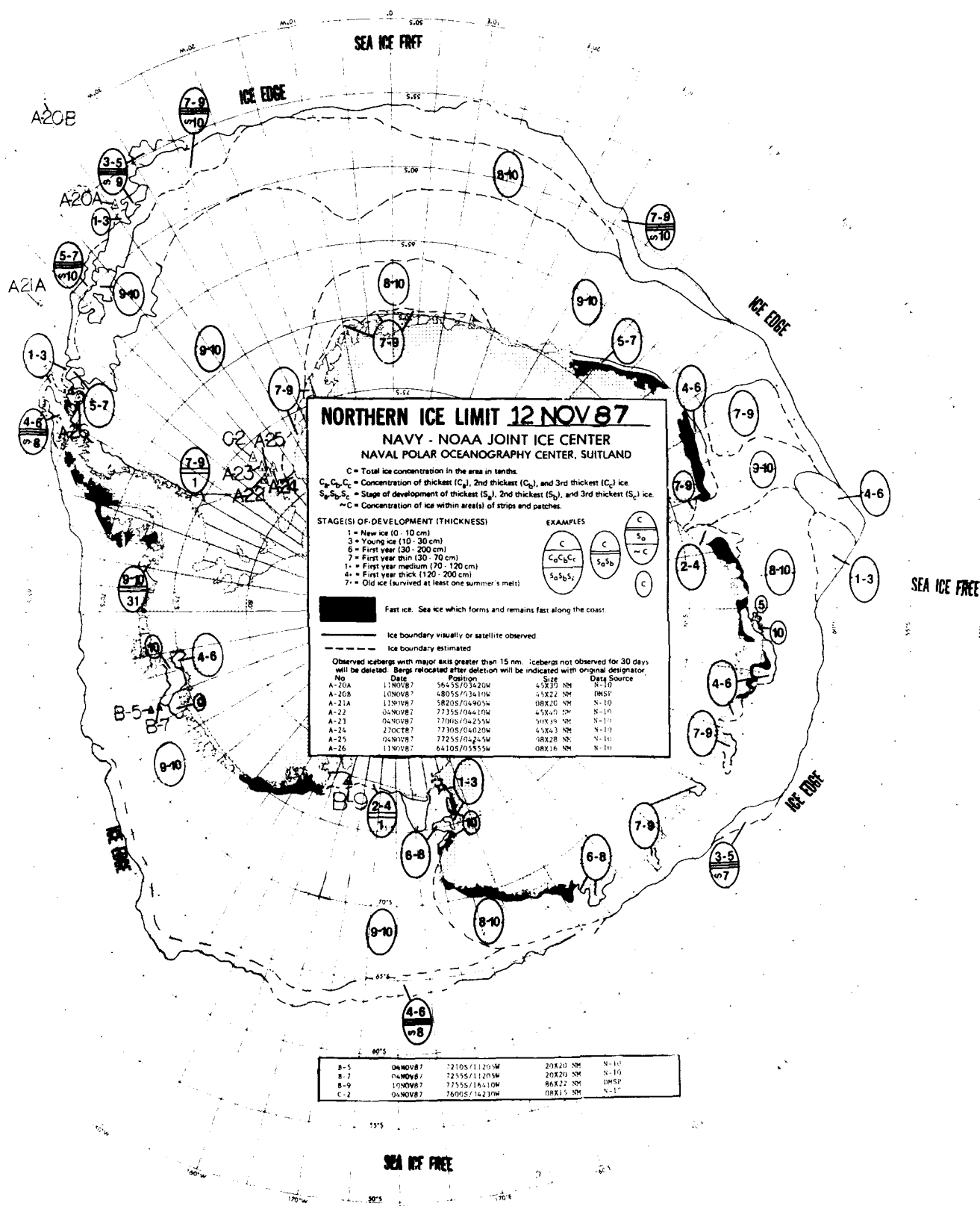
No.	Date	Position	Size	Data Source
A-20A	29OCT87	5640S/03530W	45X10 NM	DMSP
A-20B	29OCT87	5100S/04110W	45X22 NM	N-10
A-21A	22OCT87	5915S/04405W	38X20 NM	N-10
A-22	29OCT87	7305S/04415W	45X40 NM	N-10
A-23	29OCT87	7650S/04250W	50X14 NM	N-10
A-24	27OCT87	7730S/04020W	45X3 NM	DMSP
A-25	29OCT87	7715S/04225W	48X28 NM	N-10
A-26	29OCT87	6600S/03610W	48X14 NM	N-10

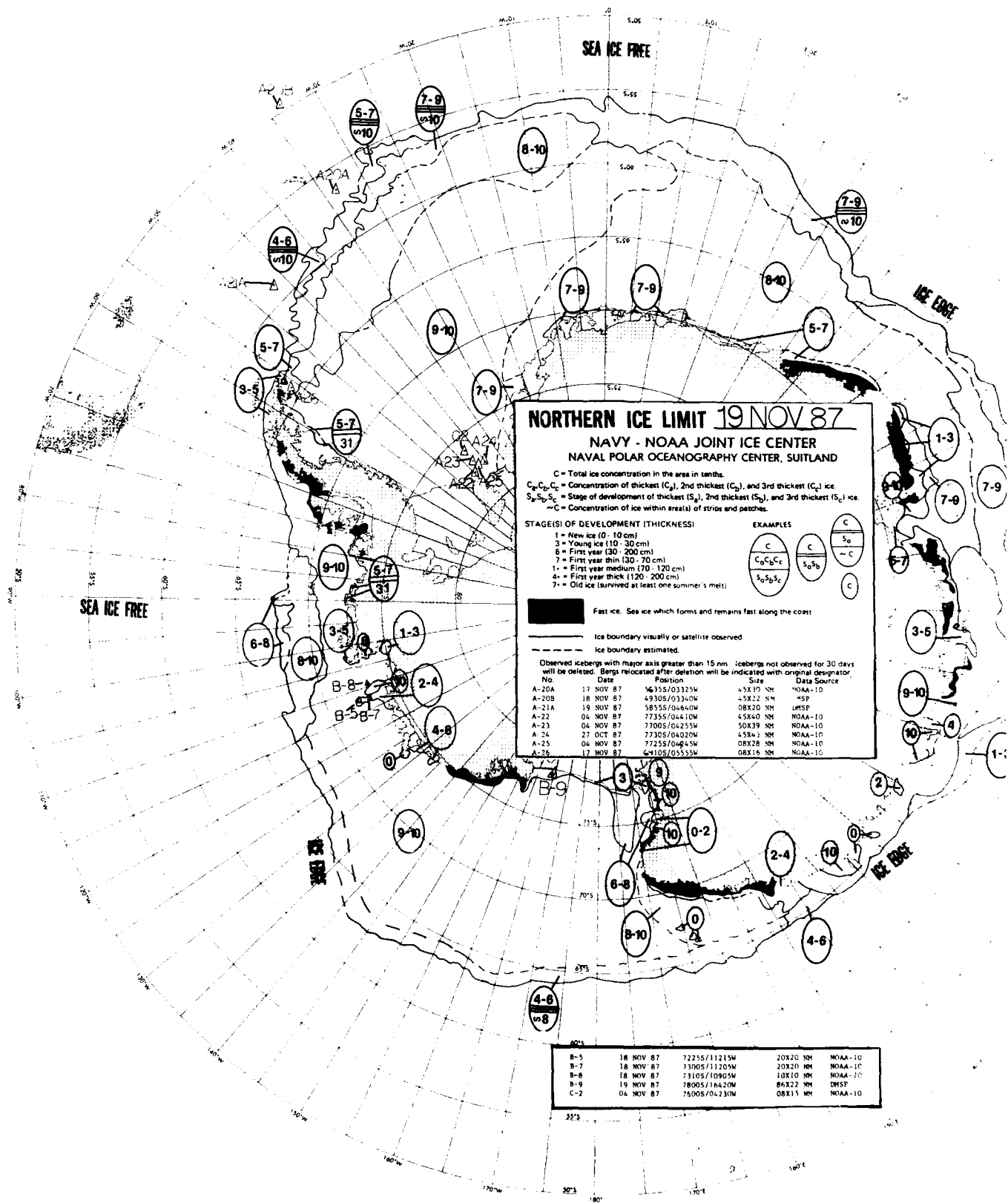
B-5	11OCT87	7220S/11200W	20X20 NM	N-10
B-7	11OCT87	7255S/11210W	25X15 NM	N-10
B-8	11OCT87	7305S/10930W	10X18 NM	N-10
B-9	29OCT87	7806S/16310W	86X22 NM	DMSP
C-2	29OCT87	7620S/04340W	48X28 NM	N-10
C-6	01OCT87	6520S/13330E	25X12 NM	N-10

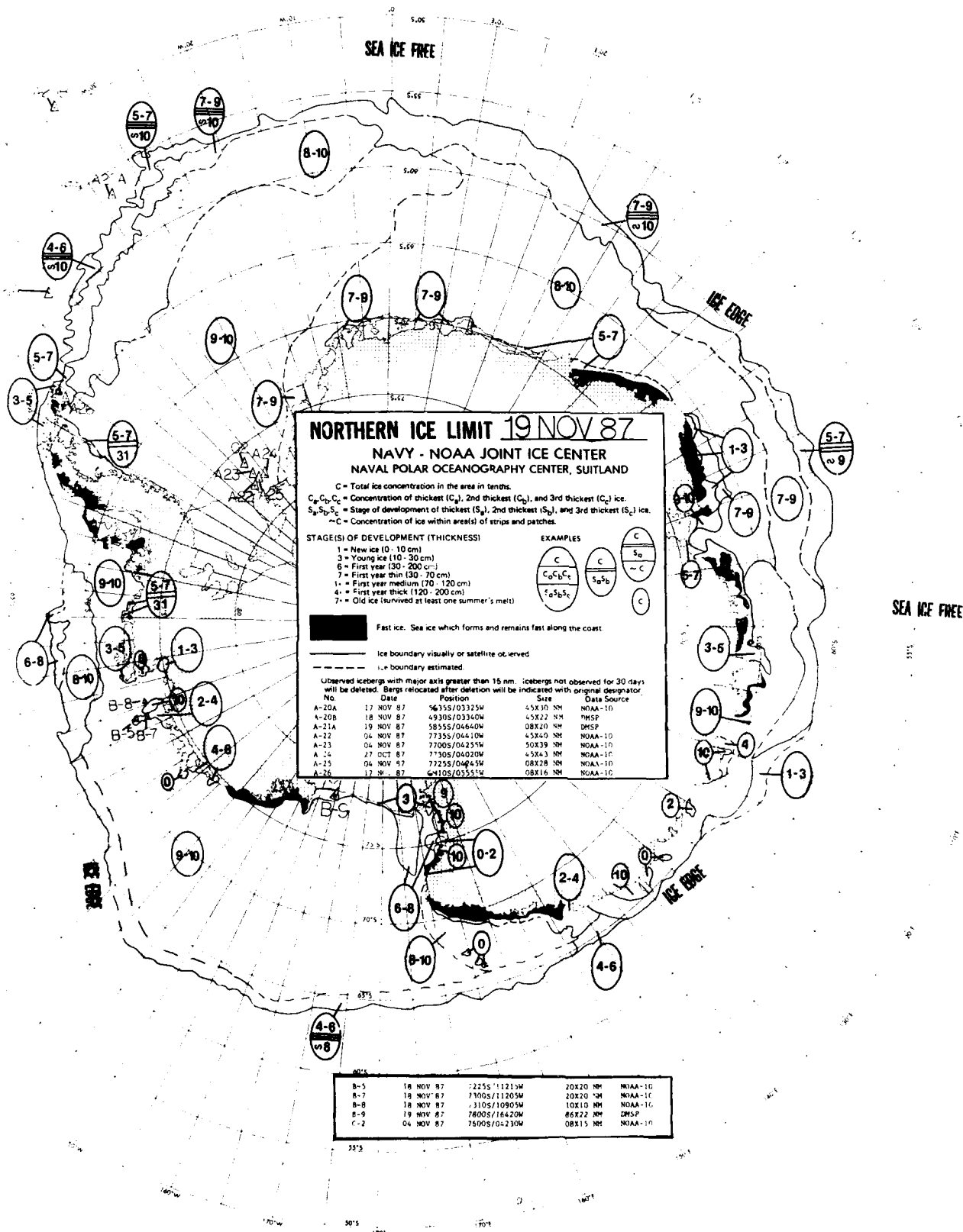


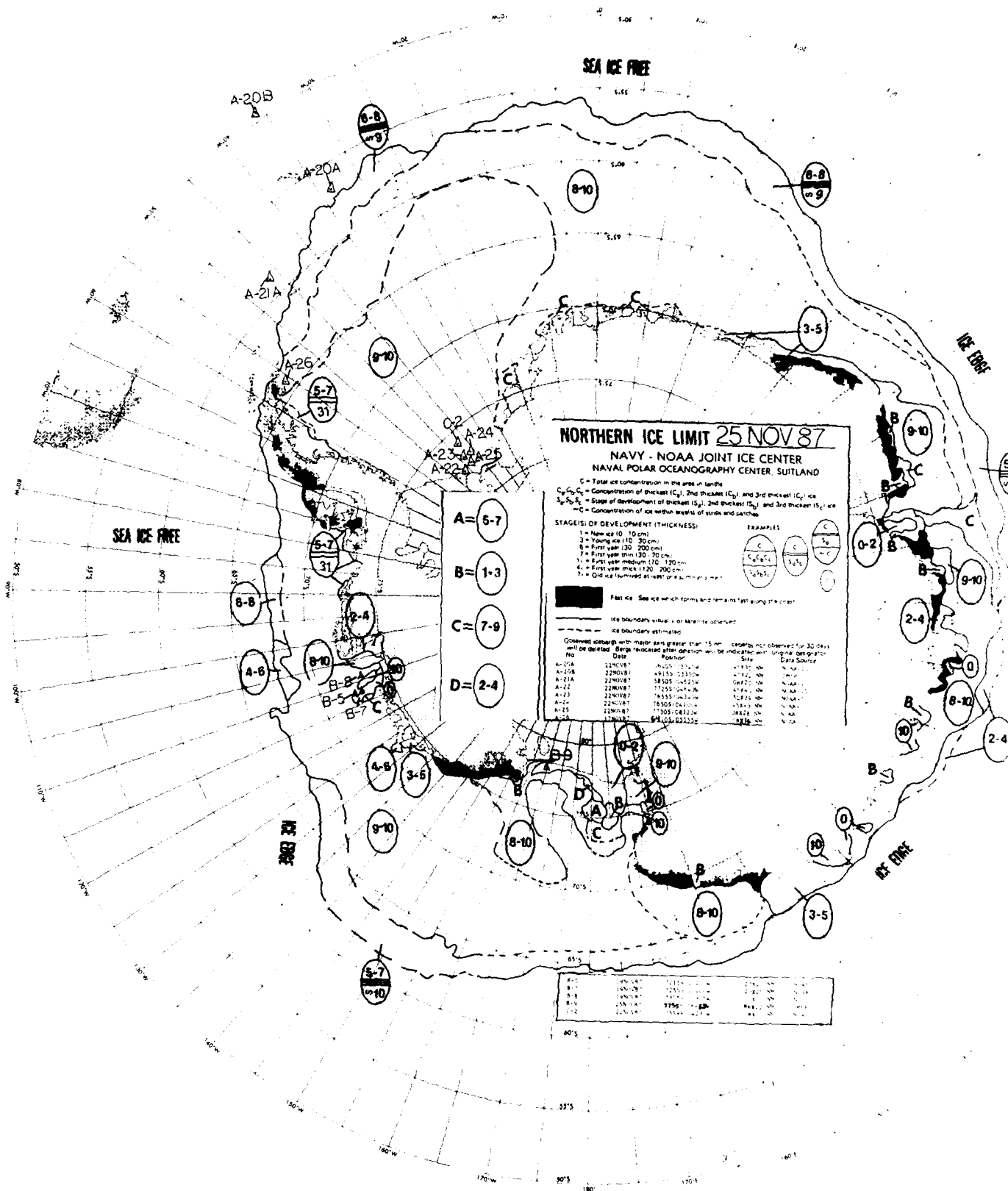


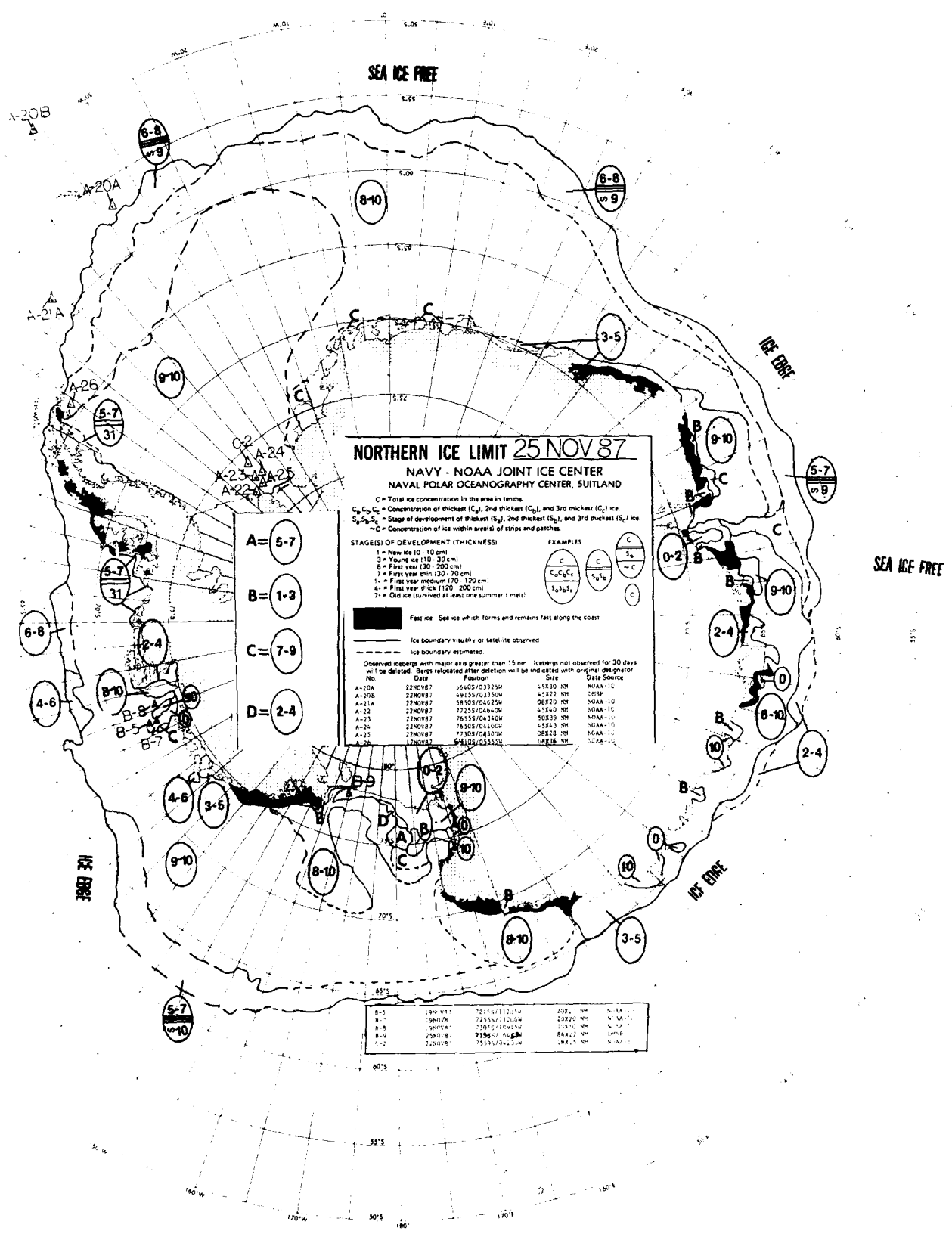


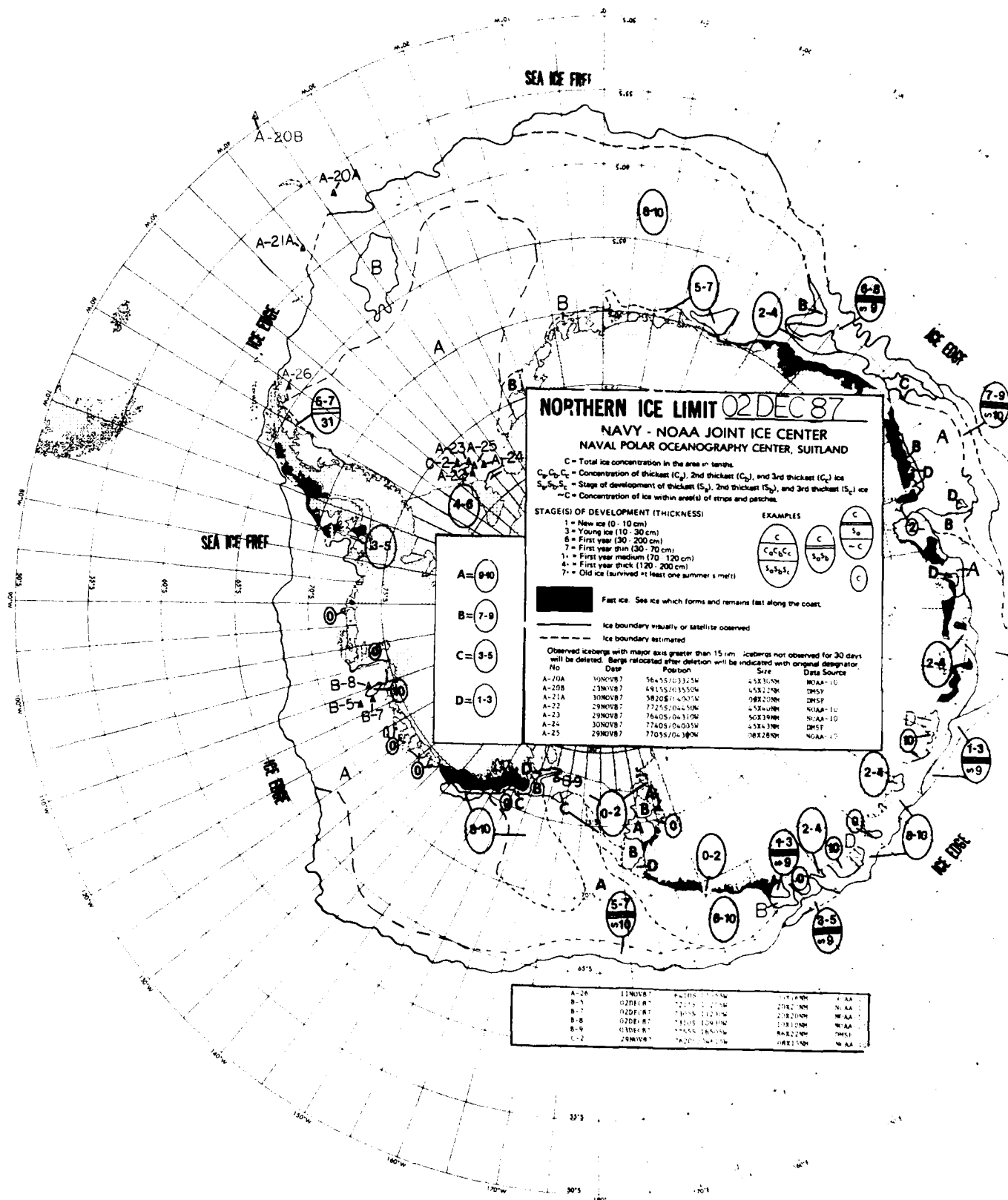


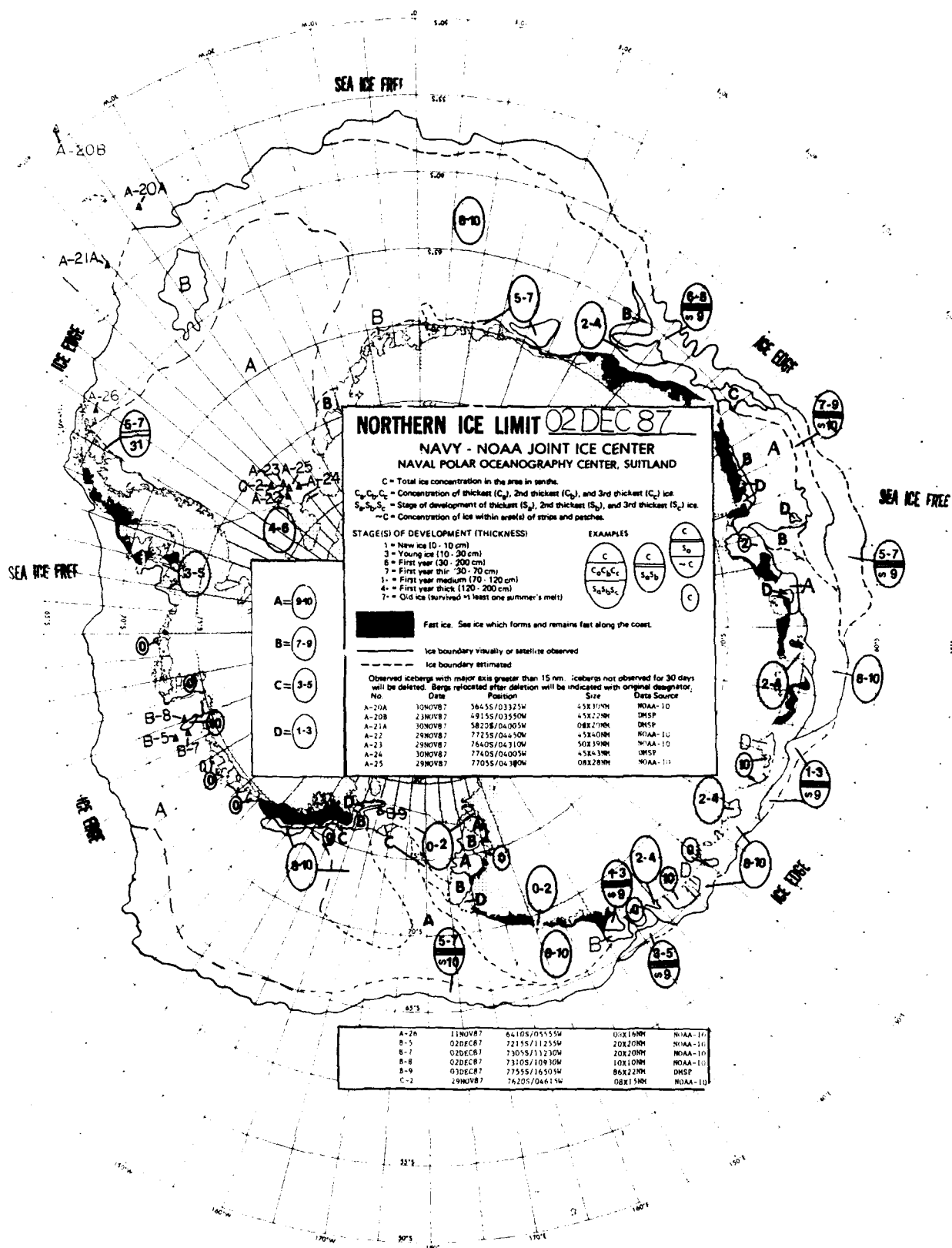


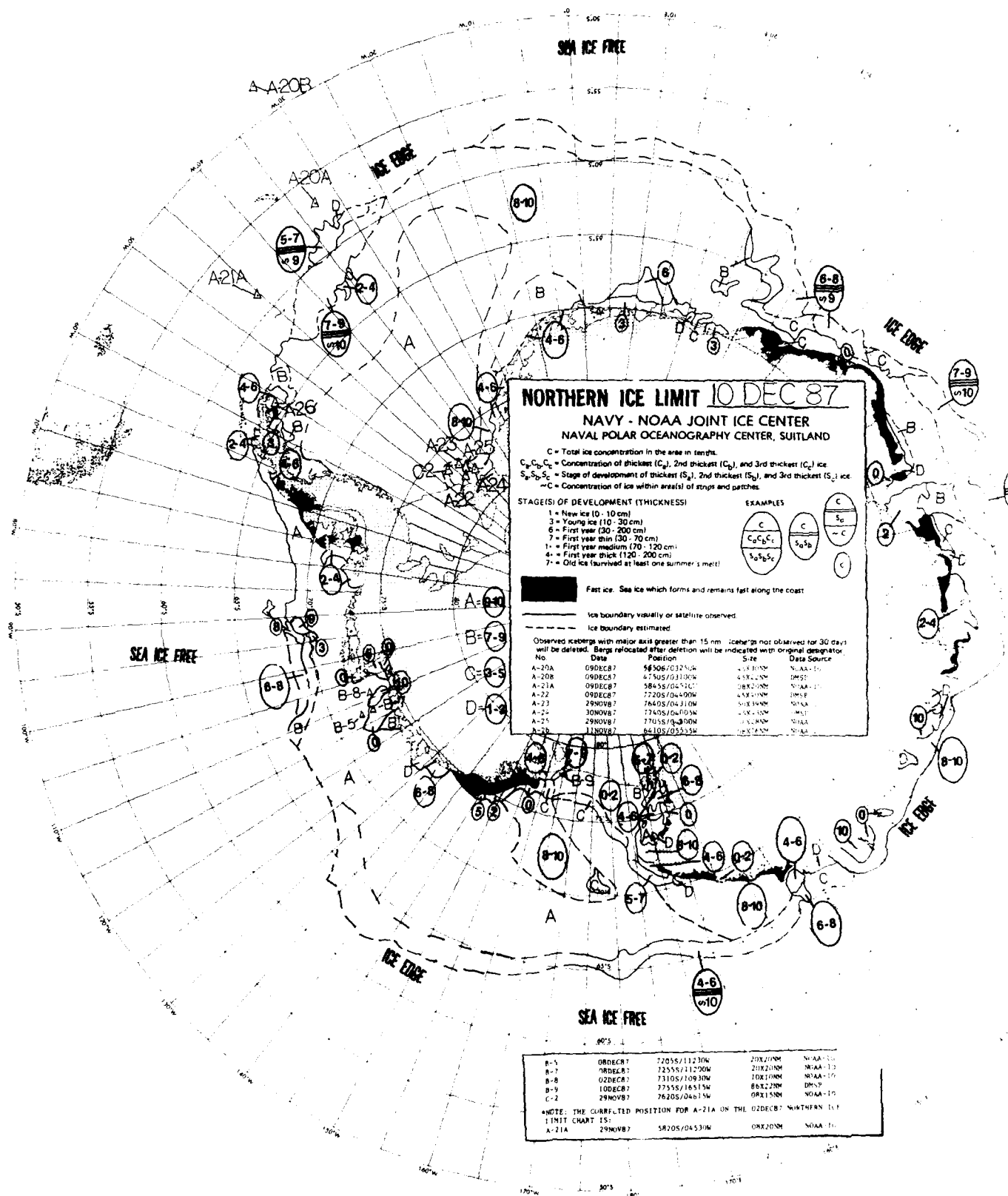


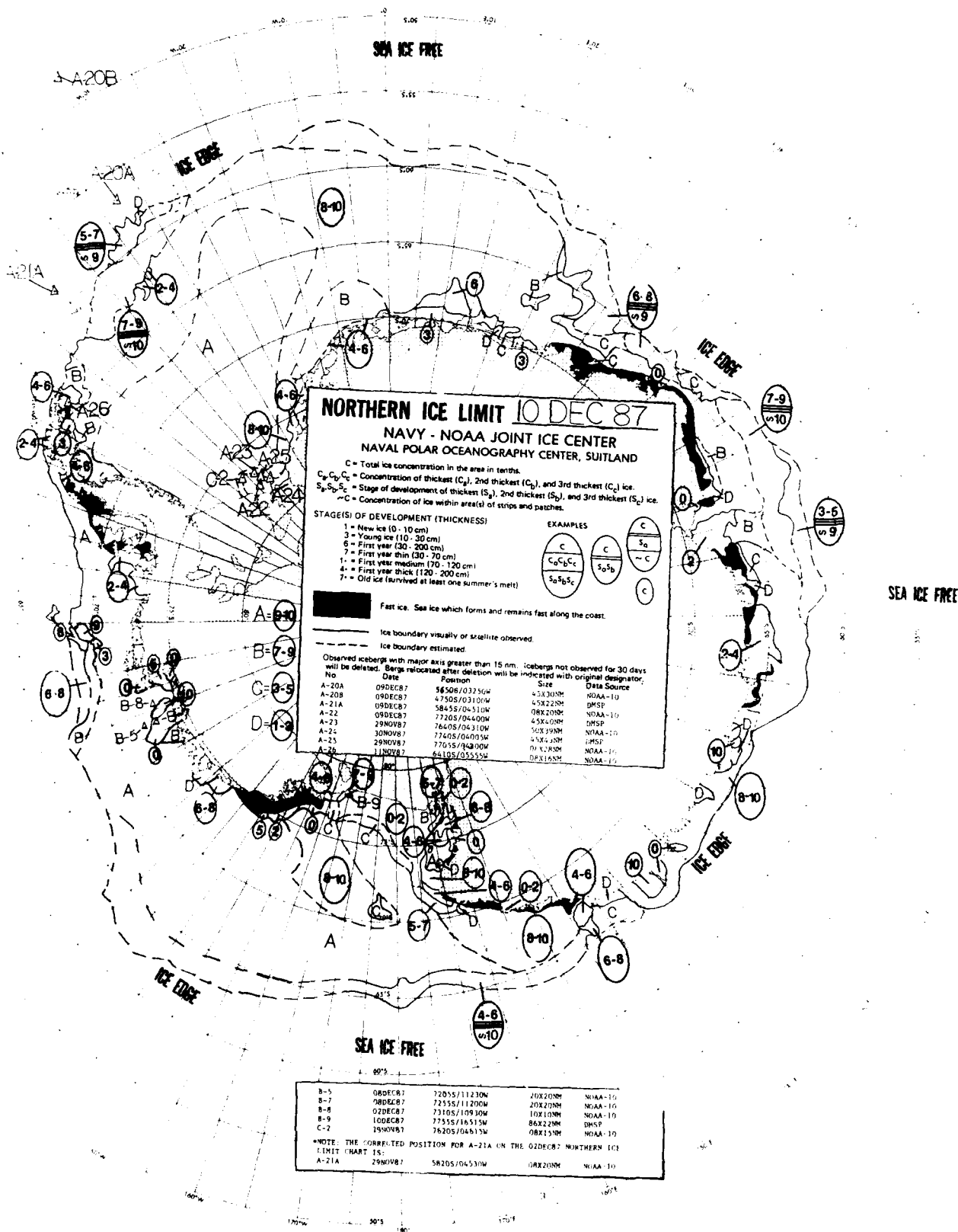


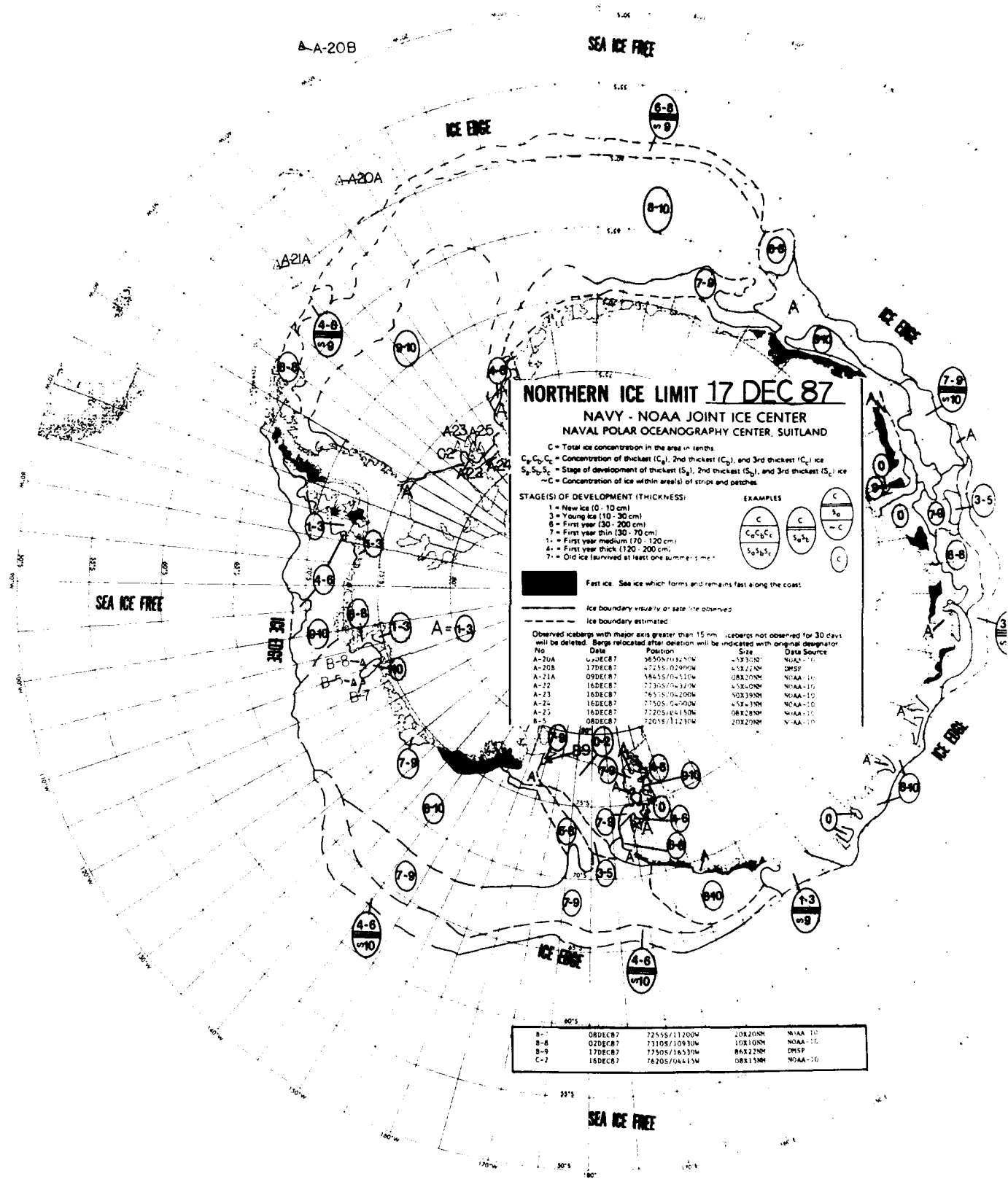












A-20B

SEA ICE FREE

ICE EDGE

A-20A

A-21A

NORTHERN ICE LIMIT 17 DEC 87

NAVY - NOAA JOINT ICE CENTER
NAVAL POLAR OCEANOGRAPHY CENTER, SUITLAND

C = Total ice concentration in the area in tenths.

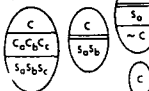
 C_1, C_2, C_3 = Concentration of thickest (C_1), 2nd thickest (C_2), and 3rd thickest (C_3) ice. S_1, S_2, S_3 = Stage of development of thickest (S_1), 2nd thickest (S_2), and 3rd thickest (S_3) ice.

~C = Concentration of ice within area(s) of strips and patches.

STAGE(S) OF DEVELOPMENT (THICKNESS)

- 1 = New ice (0 - 10 cm)
- 3 = Young ice (10 - 30 cm)
- 6 = First year (30 - 200 cm)
- 7 = First year thin (30 - 70 cm)
- 1 = First year medium (70 - 120 cm)
- 4 = First year thick (120 - 200 cm)
- 7 = Old ice (survived at least one summer's melt)

EXAMPLES



Fast ice. Sea ice which forms and remains fast along the coast.

Ice boundary visually or satellite observed

Ice boundary estimated.

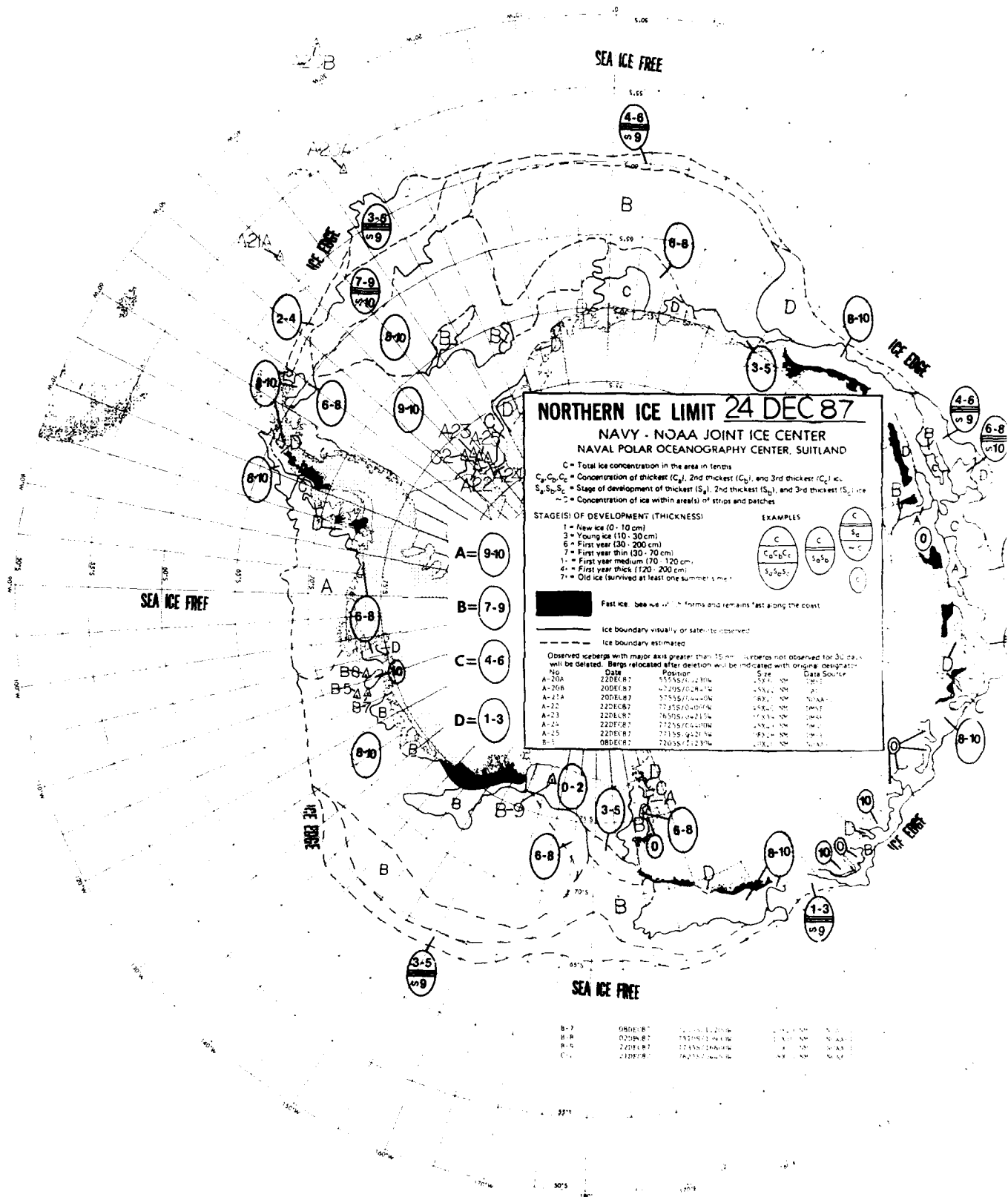
Observed icebergs with major axis greater than 15 nm. Icebergs not observed for 30 days will be deleted. Berge relocated after deletion will be indicated with original designator.

No.	Date	Position	Size	Data Source
A-20A	09DEC87	5650S/03250W	45X30NM	NOAA-10
A-20B	17DEC87	4725S/02900W	45X22NM	DMSP
A-21A	09DEC87	5845S/04510W	08X20NM	NOAA-10
A-22	14DEC87	7730S/04320W	45X40NM	NOAA-10
A-23	14DEC87	7655S/04200W	50X39NM	NOAA-10
A-24	16DEC87	7750S/04000W	45X43NM	NOAA-10
A-25	16DEC87	7720S/04150W	08X28NM	NOAA-10
B-5	08DEC87	7205S/11230W	20X20NM	NOAA-10

B-7	08DEC87	7255S/11200W	20X20NM	NOAA-10
B-8	02DEC87	7310S/10930W	10X10NM	NOAA-10
B-9	17DEC87	7750S/16530W	84X22NM	DMSP
C-2	14DEC87	7620S/04415W	08X15NM	NOAA-10

SEA ICE FREE

SEA ICE FREE



SEA ICE FREE

NORTHERN ICE LIMIT 24 DEC 87

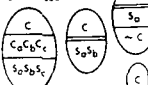
NAVY - NOAA JOINT ICE CENTER
NAVAL POLAR OCEANOGRAPHY CENTER, SUITLAND

C = Total ice concentration in the area in tenths.
C₁, C₂, C₃ = Concentration of thickest (C₁), 2nd thickest (C₂), and 3rd thickest (C₃) ice.
S₁, S₂, S₃ = Stage of development of thickest (S₁), 2nd thickest (S₂), and 3rd thickest (S₃) ice.
~C = Concentration of ice within areas of strips and patches.

STAGE(S) OF DEVELOPMENT (THICKNESS)

- 1 = New ice (10 - 100 cm)
- 2 = Young ice (100 - 200 cm)
- 3 = First year (200 - 300 cm)
- 4 = First year thin (300 - 400 cm)
- 5 = First year medium (400 - 500 cm)
- 6 = First year thick (500 - 600 cm)
- 7 = Old ice (survived at least one summer's melt)

EXAMPLES



Fast ice: Sea ice which forms and remains fast along the coast.

Ice boundary visually or satellite observed

Ice boundary estimated

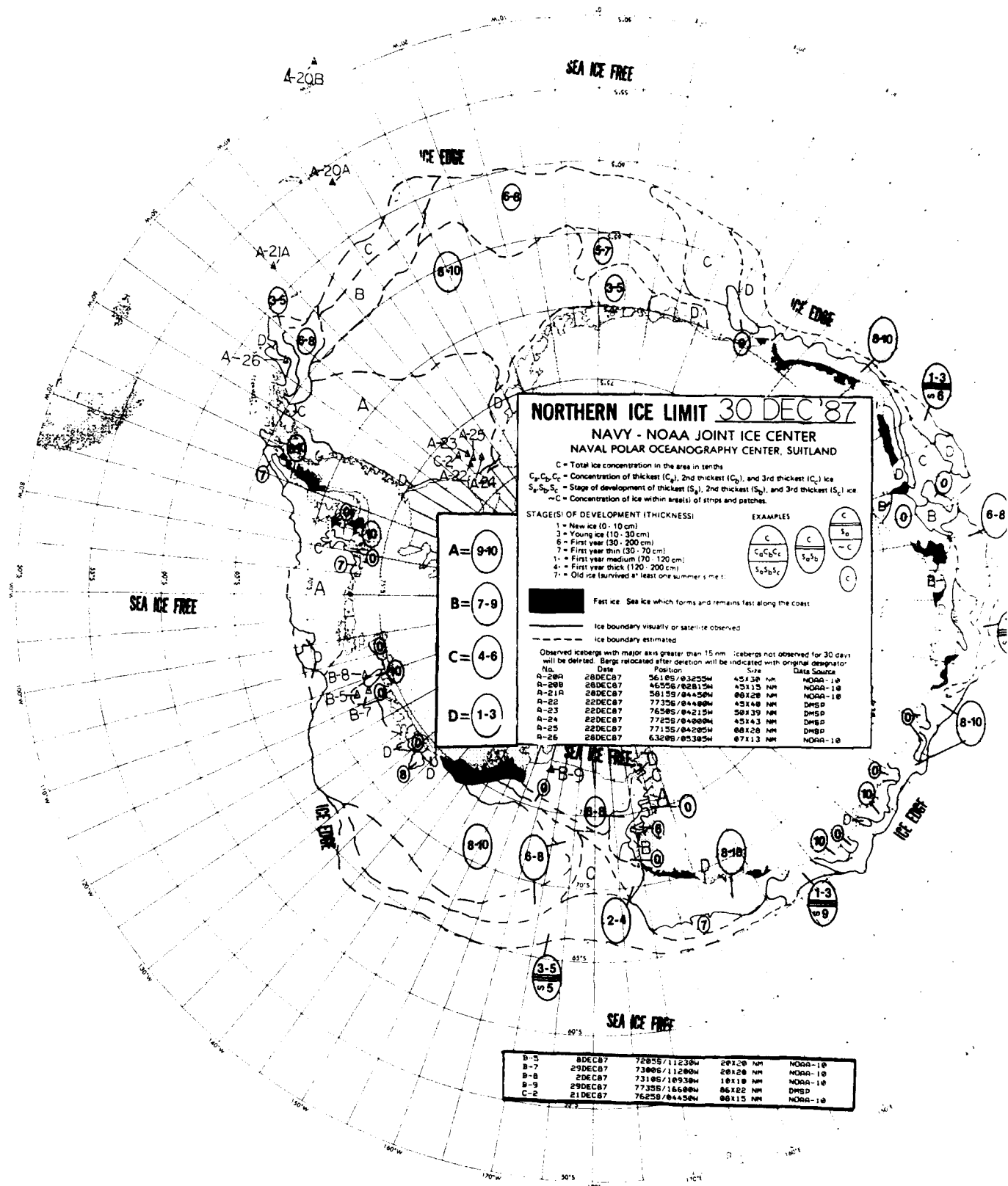
Observed icebergs with major axis greater than 15 nm - icebergs not observed for 30 days will be deleted. Bergs relocated after deletion will be indicated with original designator.

No.	Date	Position	Size	Data Source
A-20A	22DEC87	4555S/01230W	45X30 NM	DMSP
A-20B	20DEC87	4720S/02845W	45X22 NM	GAC
A-21A	20DEC87	5155S/04440W	08X20 NM	NOAA-11
A-22	22DEC87	7135S/04900W	45X40 NM	DMSP
A-23	22DEC87	7650S/04215W	50X15 NM	DMSP
A-24	22DEC87	7725S/04400W	45X15 NM	DMSP
A-25	22DEC87	7715S/04205W	08X18 NM	DMSP
B-5	08DEC87	7205S/11230W	20X20 NM	NOAA-11

SEA ICE FREE

B-7	08DEC87	7405S/11200W	40X20 NM	NOAA-11
B-8	02DEC87	7310S/10480W	10X10 NM	NOAA-11
B-9	22DEC87	7735S/14800W	4 NM	NOAA-11
C-2	21DEC87	7425S/04450W	08X15 NM	NOAA-11

SEA ICE FREE



NORTHERN ICE LIMIT 30 DEC '87

NAVY - NOAA JOINT ICE CENTER
NAVAL POLAR OCEANOGRAPHY CENTER, SUITLAND

C = Total ice concentration in the area in tenths.
 C₁, C₂, C₃ = Concentration of thickest (C₁), 2nd thickest (C₂), and 3rd thickest (C₃) ice.
 S₁, S₂, S₃ = Stage of development of thickest (S₁), 2nd thickest (S₂), and 3rd thickest (S₃) ice.
 -C = Concentration of ice within area(s) of strips and patches.

STAGE(S) OF DEVELOPMENT (THICKNESS)

- 1 = New ice (0 - 10 cm)
- 3 = Young ice (10 - 30 cm)
- 6 = First year (30 - 200 cm)
- 7 = First year thin (30 - 70 cm)
- 1 = First year medium (70 - 120 cm)
- 4 = First year thick (120 - 200 cm)
- 7 = Old ice (survived at least one summer's melt)

EXAMPLES

$\frac{C}{C_1 C_2 C_3}$
 $\frac{S_1 S_2 S_3}{-C}$

$\frac{C}{S_1 S_2 S_3}$
 $\frac{C}{-C}$

$\frac{C}{S_1 S_2 S_3}$
 $\frac{C}{-C}$

Legend:

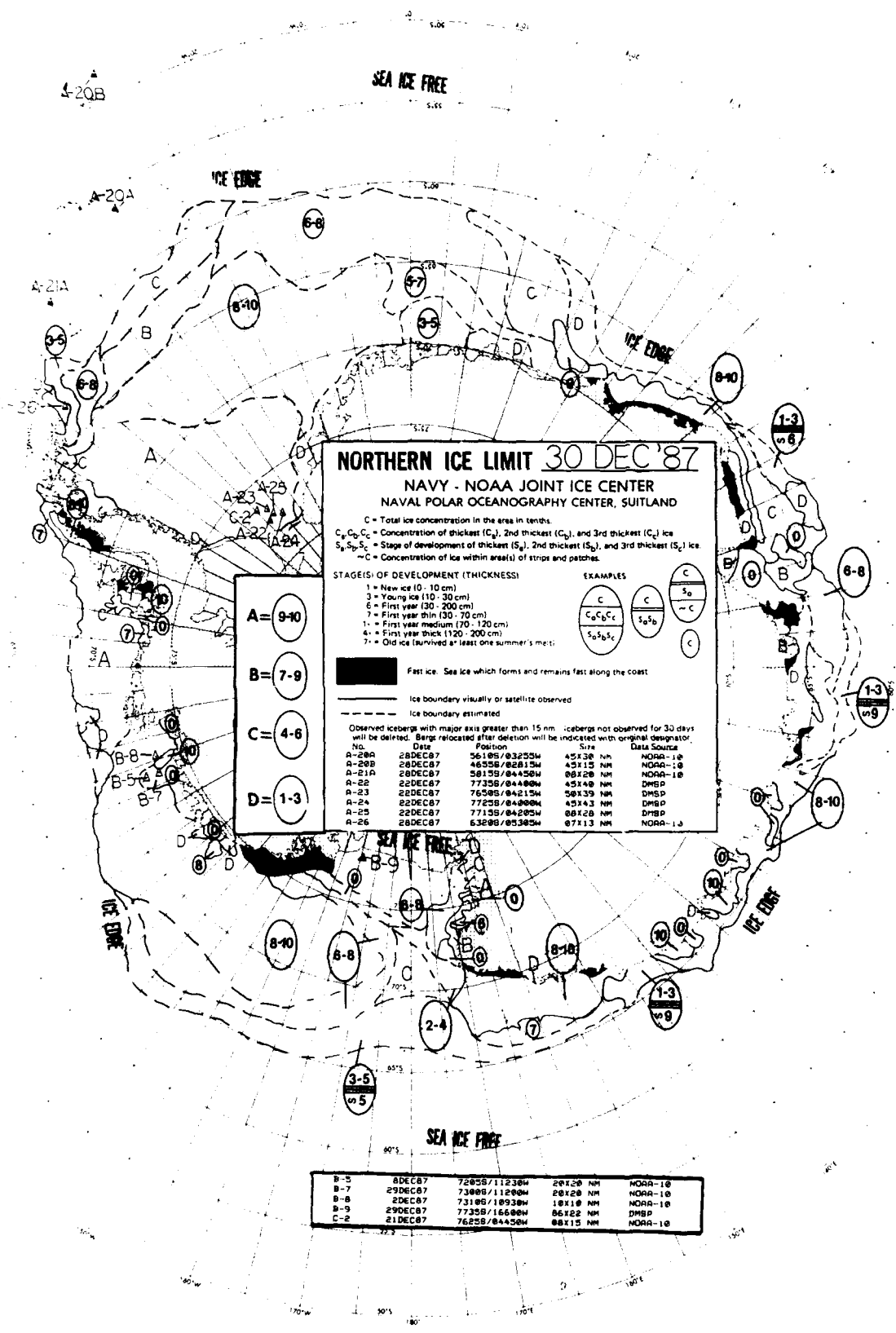
- Fast ice: Sea ice which forms and remains fast along the coast
- Ice boundary visually or satellite observed
- - - Ice boundary estimated

Observed icebergs with major axis greater than 15 nm. Icebergs not observed for 30 days will be deleted. Berge relocated after deletion will be indicated with original designator.

No.	Date	Position	Size	Data Source
A-20A	28DEC87	5610S/03255W	45X38 NM	NORR-10
A-20B	28DEC87	4655S/02815W	45X15 NM	NORR-10
A-21A	28DEC87	5815S/04450W	80X20 NM	NORR-10
A-22	22DEC87	7735S/04400W	45X40 NM	DMSP
A-23	22DEC87	7650S/04215W	50X39 NM	DMSP
A-24	22DEC87	7725S/04000W	45X43 NM	DMSP
A-25	22DEC87	7715S/04205W	80X20 NM	DMSP
A-26	28DEC87	6320S/05385W	87X13 NM	NORR-13

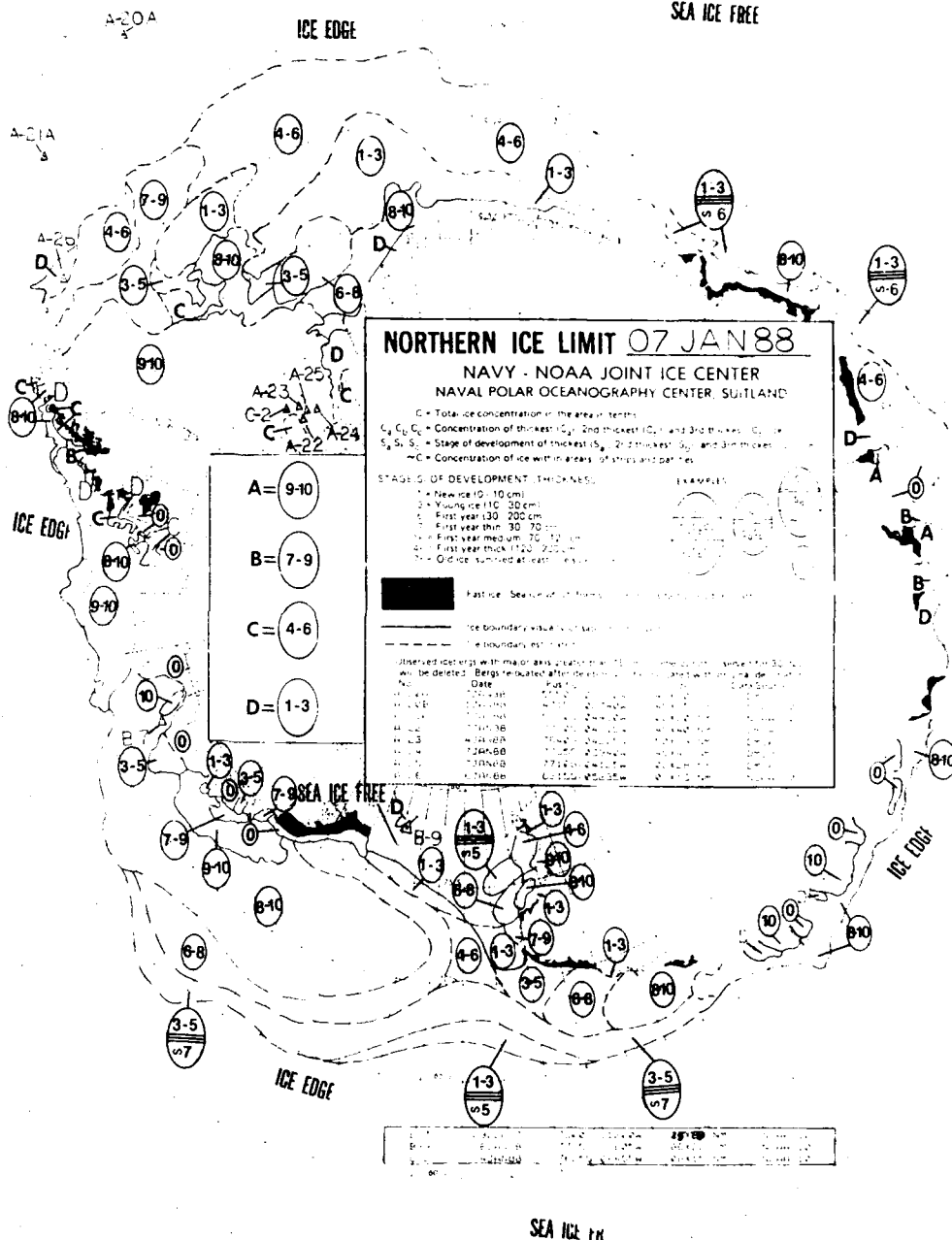
- A = 9-10**
- B = 7-9**
- C = 4-6**
- D = 1-3**

B-5	8DEC87	7205S/11230W	20X20 NM	NORR-10
B-7	29DEC87	7300S/11200W	20X20 NM	NORR-10
B-8	20DEC87	7310S/10930W	18X18 NM	NORR-10
B-9	29DEC87	7735S/16500W	86X82 NM	DMSP
C-2	21DEC87	7625S/04450W	88X15 NM	NORR-10



SEA ICE FREE

SEA ICE FREE

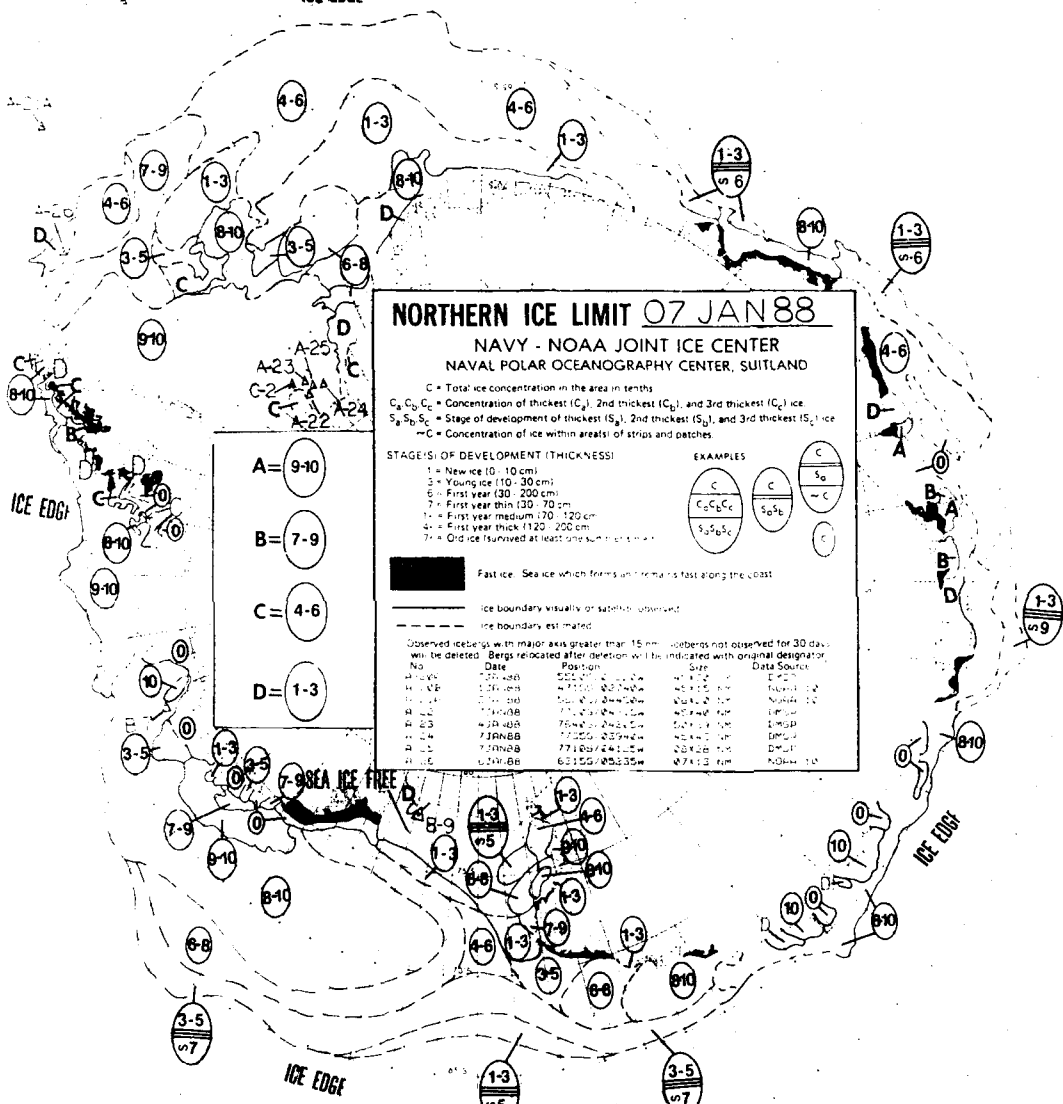


A-20B

A-20A

ICE EDGE

SEA ICE FREE



NORTHERN ICE LIMIT 07 JAN 88

NAVY - NOAA JOINT ICE CENTER

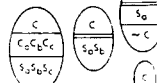
NAVAL POLAR OCEANOGRAPHY CENTER, SUITLAND

C = Total ice concentration in the area in tenths
 C₁, C₂, C₃ = Concentration of thickest (C₁), 2nd thickest (C₂), and 3rd thickest (C₃) ice
 S₁, S₂, S₃ = Stage of development of thickest (S₁), 2nd thickest (S₂), and 3rd thickest (S₃) ice
 A = Concentration of ice within areas of strips and patches

STAGES OF DEVELOPMENT (THICKNESS)

- 1 = New ice (0 - 10 cm)
- 3 = Young ice (10 - 30 cm)
- 6 = First year (30 - 200 cm)
- 7 = First year thin (30 - 70 cm)
- 8 = First year medium (70 - 120 cm)
- 9 = First year thick (120 - 200 cm)
- 10 = Old ice (survived at least one summer melt)

EXAMPLES



Fast ice: Sea ice which forms and remains fast along the coast

Ice boundary visually or satellite observed

Ice boundary estimated

Observed icebergs with major axis greater than 15 m. Icebergs not observed for 30 days will be deleted. Bergs relocated after deletion will be indicated with original designator.

No.	Date	Position	Size	Data Source
10-1	7 JAN 88	55° 10' N 150° 10' W	45 x 15 m	NOAA-12
10-2	7 JAN 88	55° 10' N 150° 10' W	45 x 15 m	NOAA-12
10-3	7 JAN 88	55° 10' N 150° 10' W	45 x 15 m	NOAA-12
10-4	7 JAN 88	55° 10' N 150° 10' W	45 x 15 m	NOAA-12
10-5	7 JAN 88	55° 10' N 150° 10' W	45 x 15 m	NOAA-12
10-6	7 JAN 88	55° 10' N 150° 10' W	45 x 15 m	NOAA-12
10-7	7 JAN 88	55° 10' N 150° 10' W	45 x 15 m	NOAA-12
10-8	7 JAN 88	55° 10' N 150° 10' W	45 x 15 m	NOAA-12
10-9	7 JAN 88	55° 10' N 150° 10' W	45 x 15 m	NOAA-12
10-10	7 JAN 88	55° 10' N 150° 10' W	45 x 15 m	NOAA-12

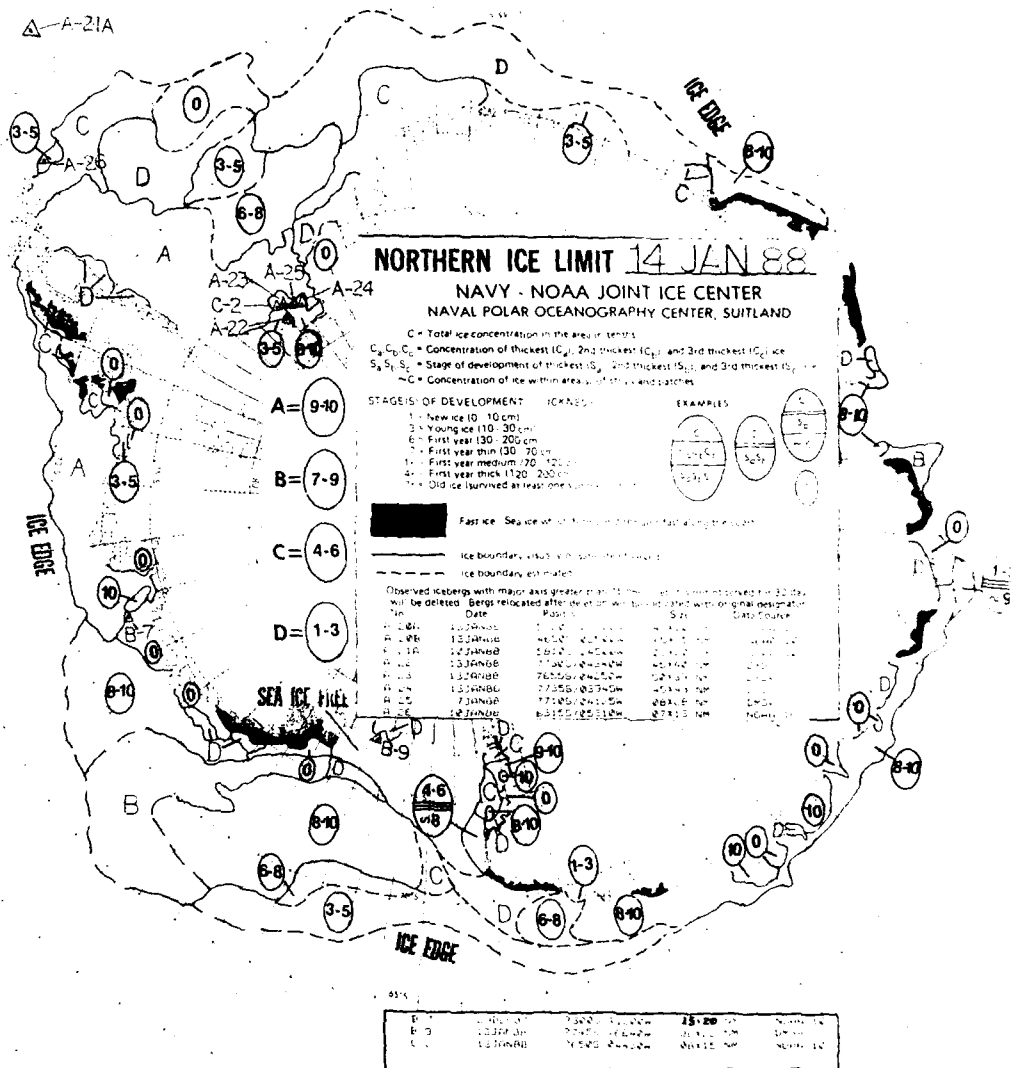
SEA ICE FREE

△-A-20B

△-A-20A

△-A-21A

SEA ICE FREE



SEA ICE FREE

Δ-A-20B

Δ-A-20A

SEA ICE FREE

Δ-A-21A

NORTHERN ICE LIMIT 14 JAN 88

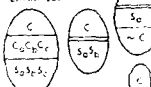
NAVY - NOAA JOINT ICE CENTER
NAVAL POLAR OCEANOGRAPHY CENTER, SUITLAND

C = Total ice concentration in the area in tenths
C₁, C₂, C₃ = Concentration of thickest (C₁), 2nd thickest (C₂), and 3rd thickest (C₃) ice
S₁, S₂, S₃ = Stage of development of thickest (S₁), 2nd thickest (S₂), and 3rd thickest (S₃) ice
C = Concentration of ice within area of strips and patches

STAGE(S) OF DEVELOPMENT (THICKNESS)

- 1 = New ice (0 - 10 cm)
- 2 = Young ice (10 - 30 cm)
- 3 = First year thin (30 - 70 cm)
- 4 = First year medium (70 - 120 cm)
- 5 = First year thick (120 - 200 cm)
- 6 = Old ice (survived at least one summer)

EXAMPLES



Fast ice - Sea ice which forms and remains fast along the coast

Ice boundary visually or satellite formed
Ice boundary estimated

Observed icebergs with major axis greater than 15 m. Icebergs not observed for 30 days will be deleted. Bergs relocated after deletion will be indicated with original designator.

No.	Date	Position	Size	Data Source
A-20A	13 JAN 88	75°00'N 150°00'W	15 x 10 NM	NOAA
A-20B	13 JAN 88	75°00'N 150°00'W	15 x 10 NM	NOAA
A-21A	13 JAN 88	75°00'N 150°00'W	15 x 10 NM	NOAA
A-21B	13 JAN 88	75°00'N 150°00'W	15 x 10 NM	NOAA
A-22	13 JAN 88	75°00'N 150°00'W	15 x 10 NM	NOAA
A-23	13 JAN 88	75°00'N 150°00'W	15 x 10 NM	NOAA
A-24	13 JAN 88	75°00'N 150°00'W	15 x 10 NM	NOAA
A-25	13 JAN 88	75°00'N 150°00'W	15 x 10 NM	NOAA
A-26	13 JAN 88	75°00'N 150°00'W	15 x 10 NM	NOAA

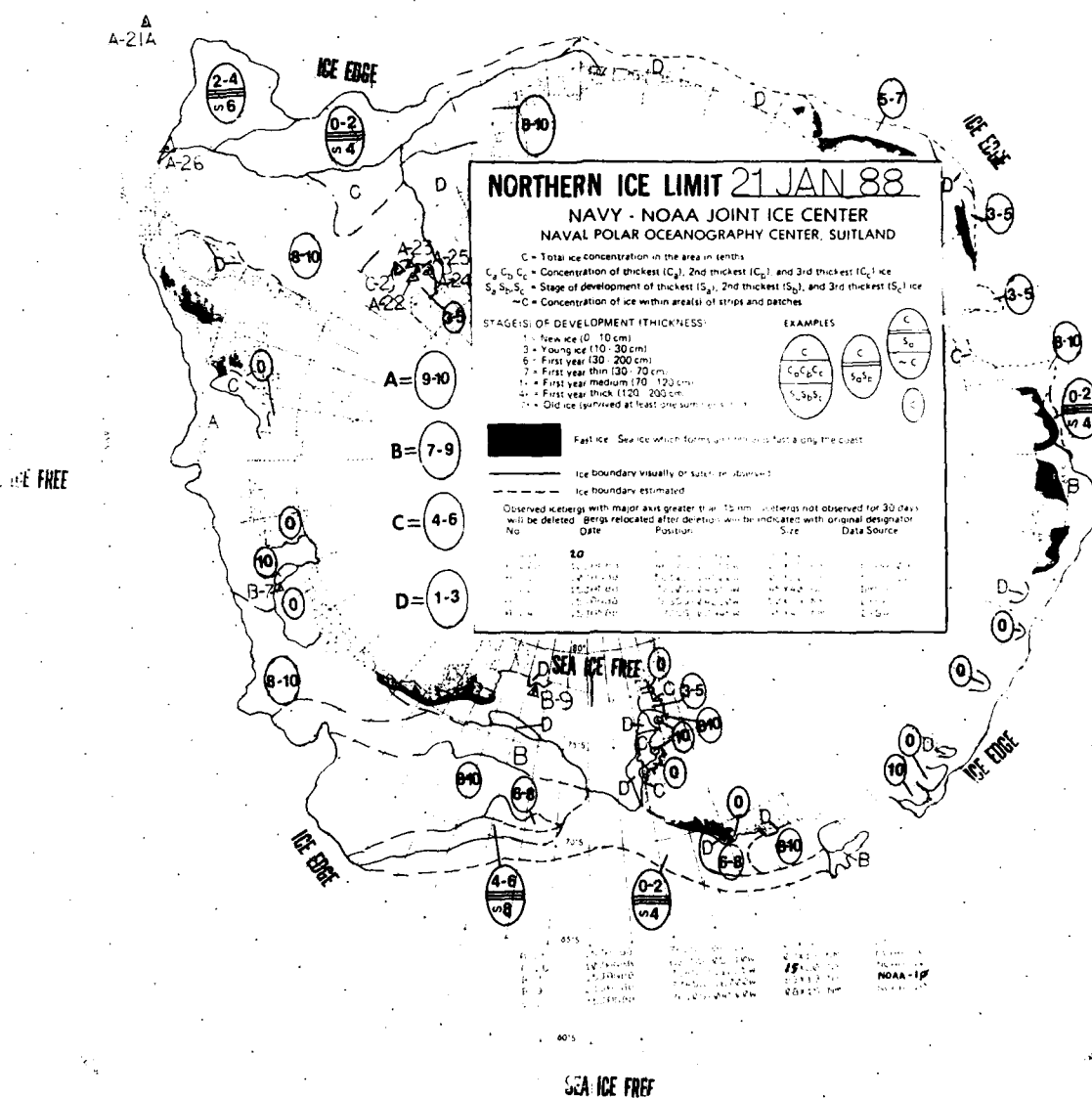
A-20A	75°00'N 150°00'W	15 x 10 NM	NOAA
A-20B	75°00'N 150°00'W	15 x 10 NM	NOAA
A-21A	75°00'N 150°00'W	15 x 10 NM	NOAA

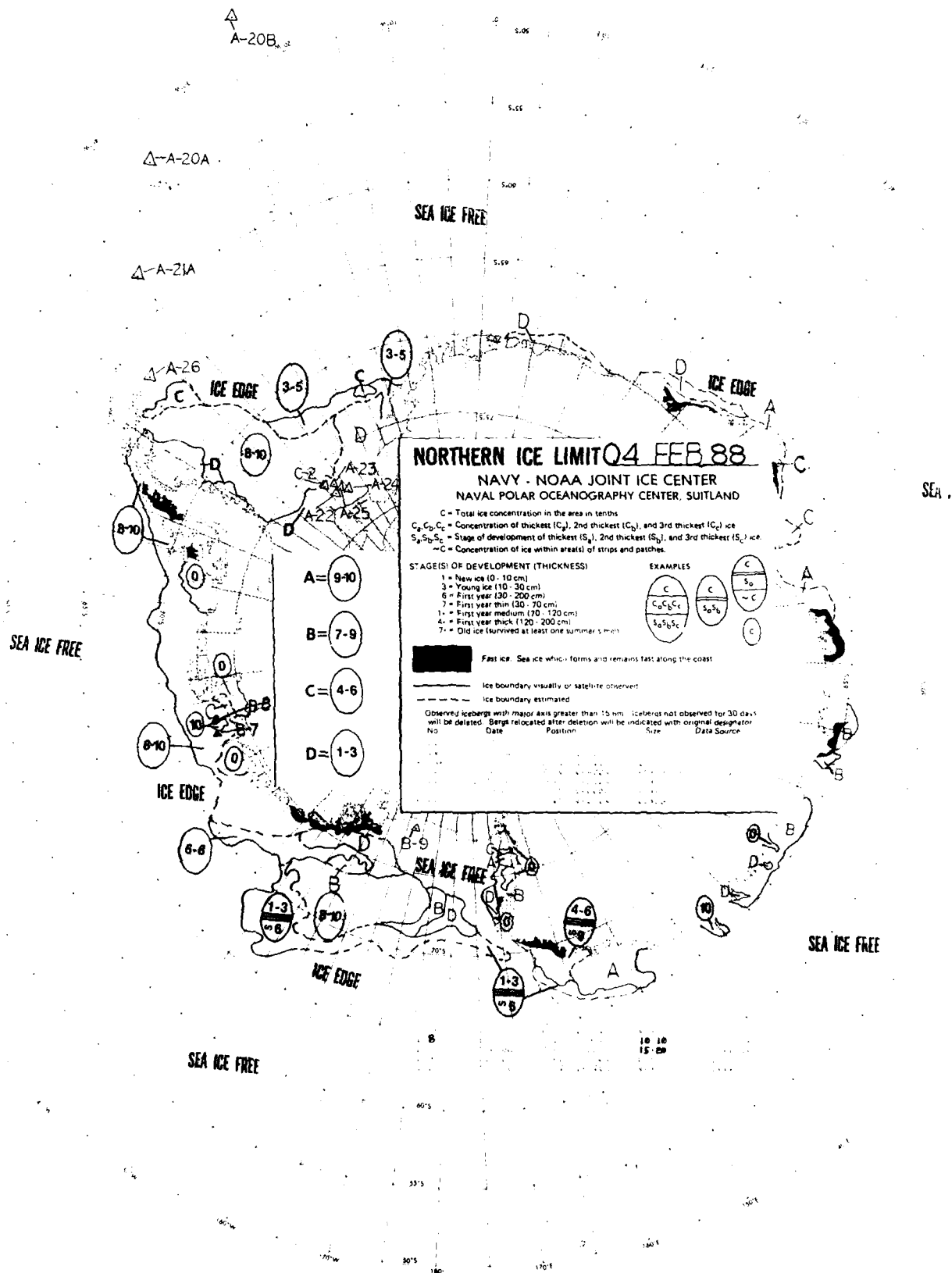
SEA ICE FREE

A-20A

SEA ICE FREE

A-21A





A-208

A-20A

SEA ICE FREE

NORTHERN ICE LIMIT 11 FEB '88

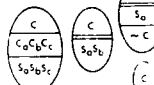
NAVY - NOAA JOINT ICE CENTER
NAVAL POLAR OCEANOGRAPHY CENTER, SUITLAND

C = Total ice concentration in the area in tenths
C₁, C₂, C₃ = Concentration of thickest (C₁), 2nd thickest (C₂), and 3rd thickest (C₃) ice
S₁, S₂, S₃ = Stage of development of thickest (S₁), 2nd thickest (S₂), and 3rd thickest (S₃) ice
-C = Concentration of ice within areals of strips and patches

STAGE(S) OF DEVELOPMENT (THICKNESS)

- 1 = New ice (0 - 10 cm)
- 3 = Young ice (10 - 30 cm)
- 6 = First year thin (30 - 70 cm)
- 7 = First year thin (30 - 70 cm)
- 1 = First year medium (70 - 120 cm)
- 4 = First year thick (120 - 200 cm)
- 7 = Old ice (survived at least one summer melt)

EXAMPLES



Fast ice: Sea ice which forms and remains fast along the coast
Ice boundary visually or satellite observed
Ice boundary estimated
Observed icebergs with major axis greater than 15 nm. Icebergs not observed for 30 days will be deleted. Bergs relocated after deletion will be indicated with original designator.
No Date Position Size Data Source

19 10
15 20

SEA ICE 1.

SEA ICE FREE

SEA ICE FREE

ICEBERG REPORTS FROM SHIP W/ SIGNED EXPRESS

ICEBERG LAST OBSERVED IN NAVY
LOCATION: 60° 07' N 150° 15' W
APPROXIMATELY 100 NM OFF SUITLAND
IN AN EAST OR EASTERLY DIRECTION
WAS ALSO APPARENTLY OBSERVED FROM
1978 TO 1982.

A-20B

A-20A

SEA ICE FREE

NORTHERN ICE LIMIT 18 FEB '88

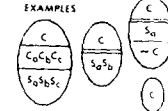
NAVY - NOAA JOINT ICE CENTER
NAVAL POLAR OCEANOGRAPHY CENTER, SUITLAND

C = Total ice concentration in the area in tenths
C₁C₂C₃ = Concentration of thickest (C₁), 2nd thickest (C₂), and 3rd thickest (C₃) ice
S₁S₂S₃ = Stage of development of thickest (S₁), 2nd thickest (S₂), and 3rd thickest (S₃) ice
-C = Concentration of ice within areas of strips and patches

STAGE(S) OF DEVELOPMENT (THICKNESS)

- 1 = New ice (0 - 10 cm)
- 2 = Young ice (10 - 30 cm)
- 3 = First year (30 - 200 cm)
- 4 = First year thin (30 - 70 cm)
- 5 = First year medium (70 - 120 cm)
- 6 = First year thick (120 - 200 cm)
- 7 = Old ice (survived at least one summer's melt)

EXAMPLES



Fast ice: Sea ice which forms and remains fast along the coast

Ice boundary visually or satellite observed
Ice boundary estimated

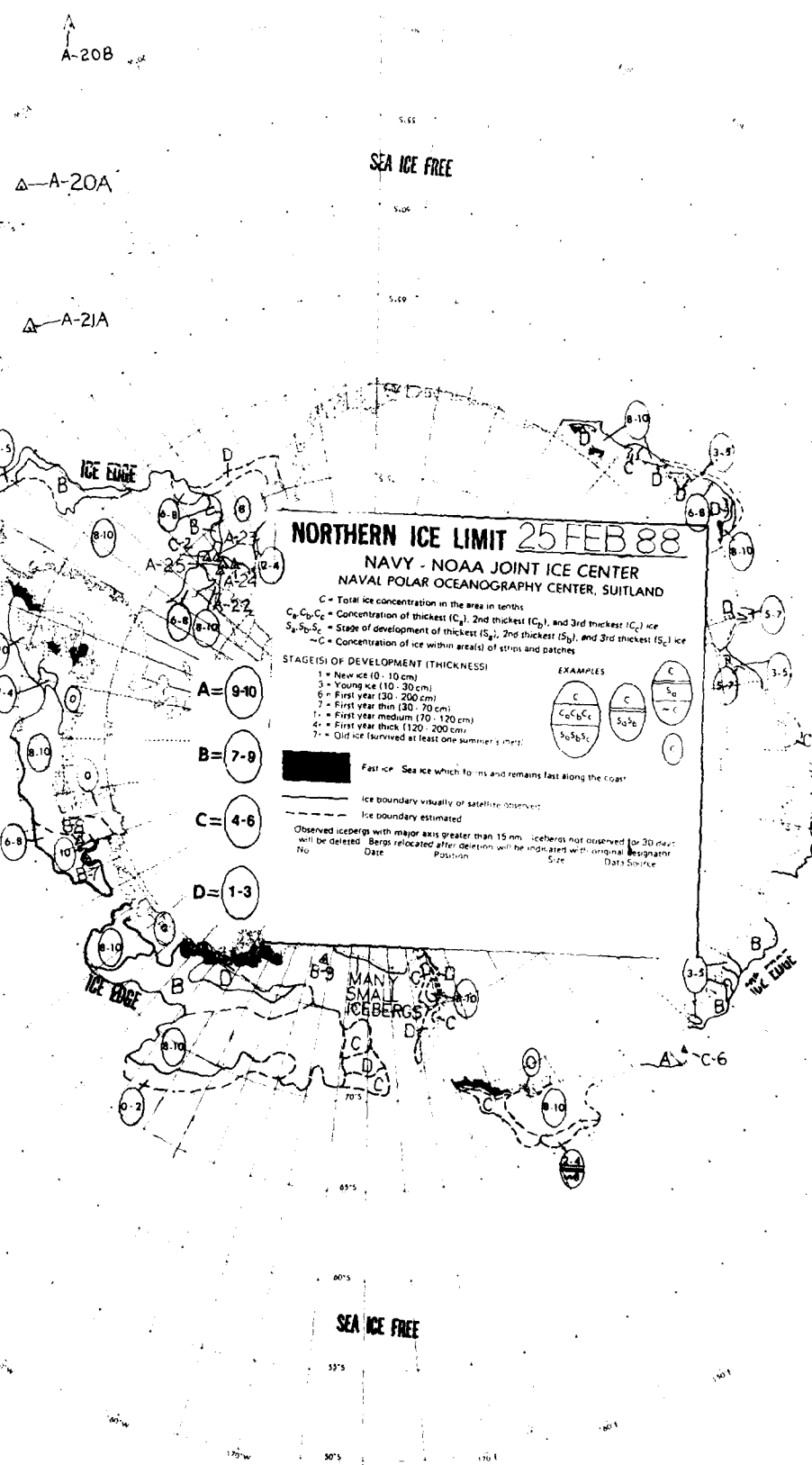
Observed icebergs with major axis greater than 15 nm. Icebergs not observed for 30 days will be deleted. Bergs relocated after deletion will be indicated with original designator.

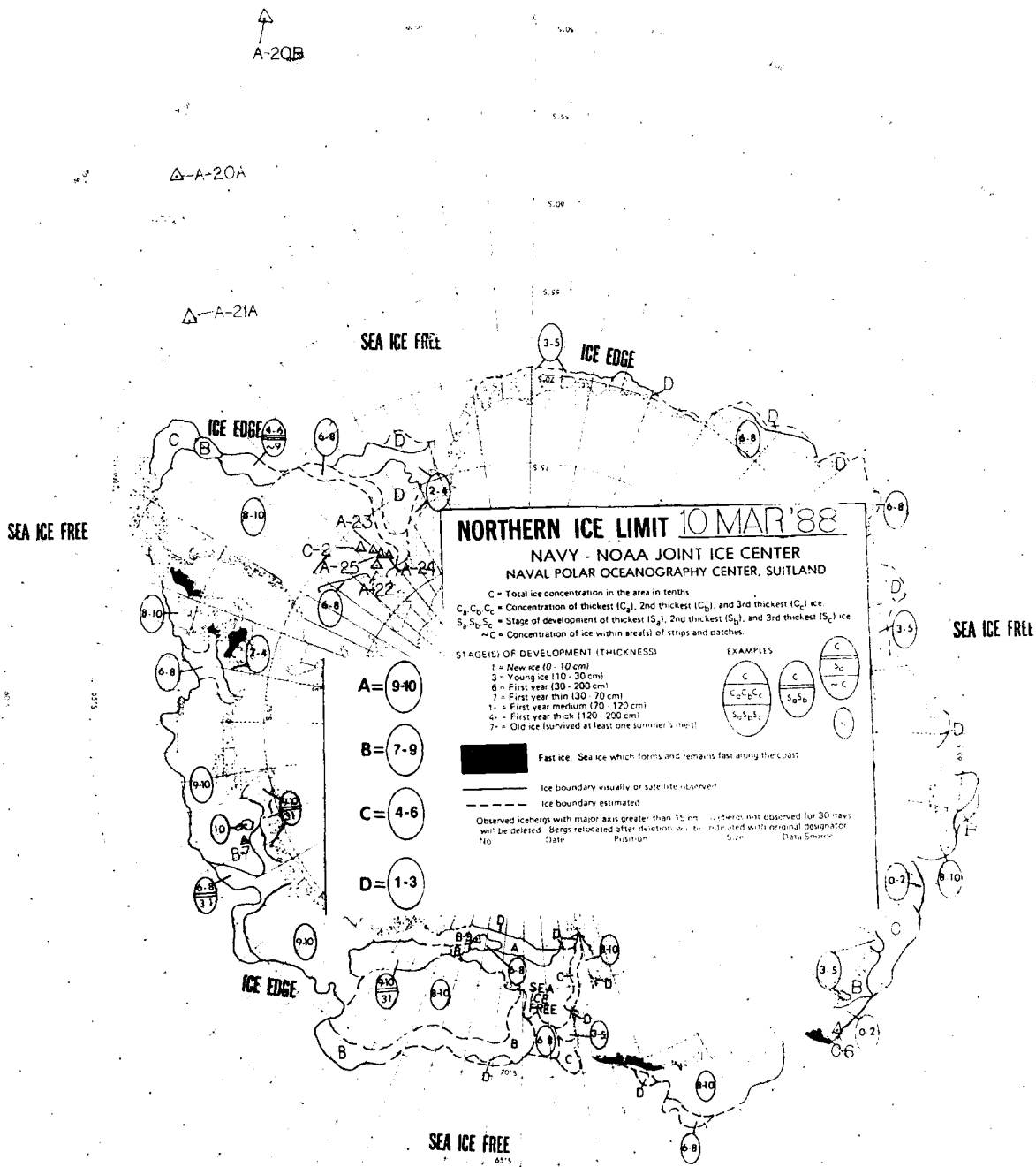
No.	Date	Position	Size	Data Source
A-20A	17 FEB 88	5320S/03320W	45X10 NM	DMSP
A-20B	9 FEB 88	4620S/02220W	20X10 NM	NOAA-09
A-22	8 FEB 88	7720S/04410W	45X40 NM	DMSP
A-23	8 FEB 88	7650S/04230W	50X39 NM	DMSP
A-24	8 FEB 88	7710S/04000W	45X41 NM	DMSP
A-25	8 FEB 88	7705S/04200W	08X28 NM	DMSP

B-7	17 FEB 88	7245S/11241W	15X20 NM	NOAA-09
B-8	24 JAN 88	7105S/10930W	10X10 NM	NOAA-10
B-9	17 FEB 88	7735S/16655W	8X19 NM	NOAA-09
C-6	27 JAN 88	6520S/13330E	25X15 NM	DMSP

SEA ICE FREE

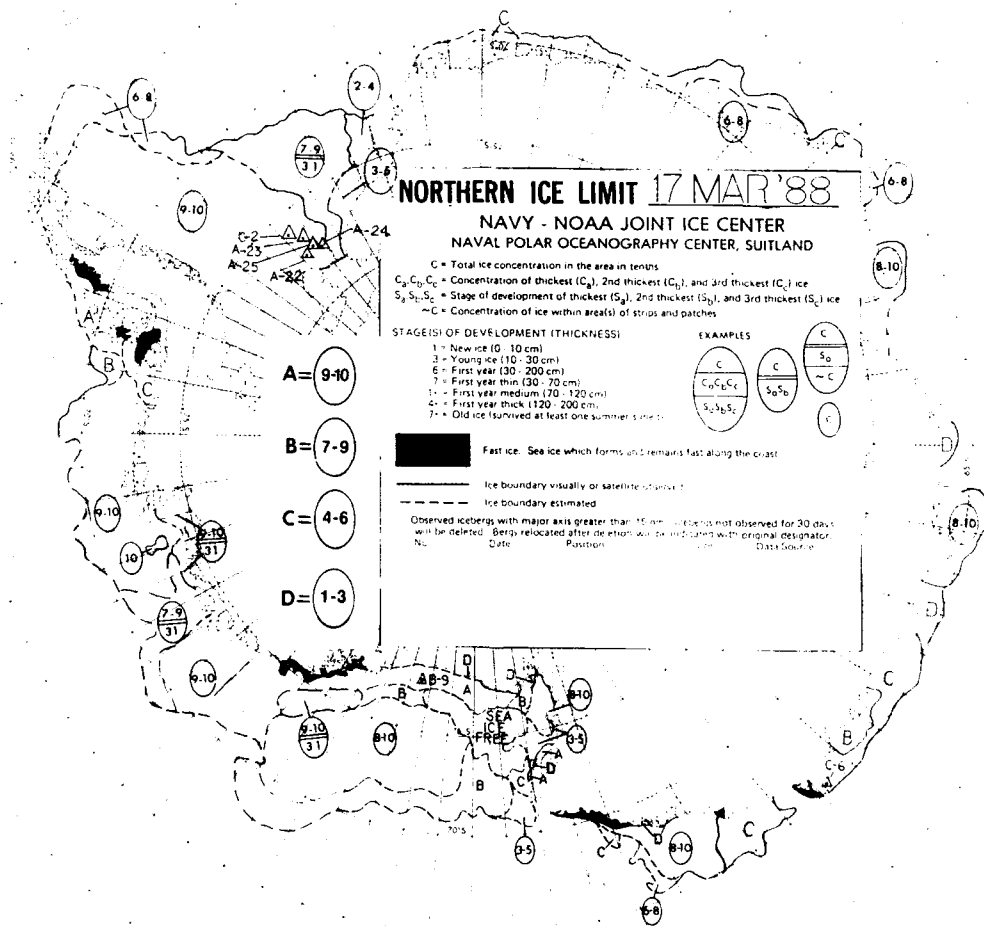
THESE DATA WERE OBTAINED FROM THE NAVY - NOAA JOINT ICE CENTER. THE DATA ARE PRESENTED AS IS. THE CENTER DOES NOT WARRANT THE ACCURACY OF THE DATA. THE CENTER IS NOT RESPONSIBLE FOR ANY DAMAGE OR LOSS OF DATA. THE CENTER IS NOT RESPONSIBLE FOR ANY DAMAGE OR LOSS OF DATA.





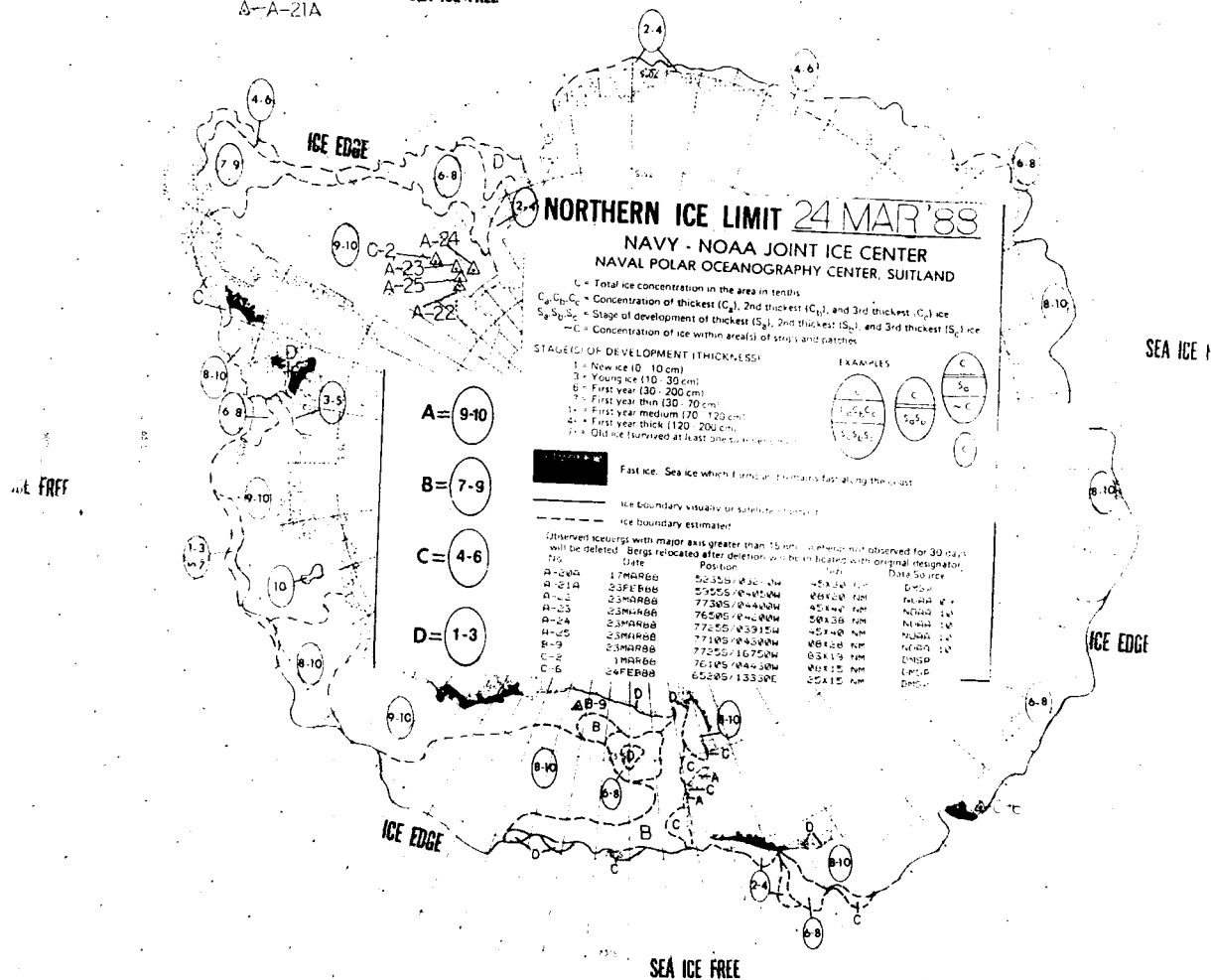
Δ-A-20A

Δ-A-21A



A-A-21A

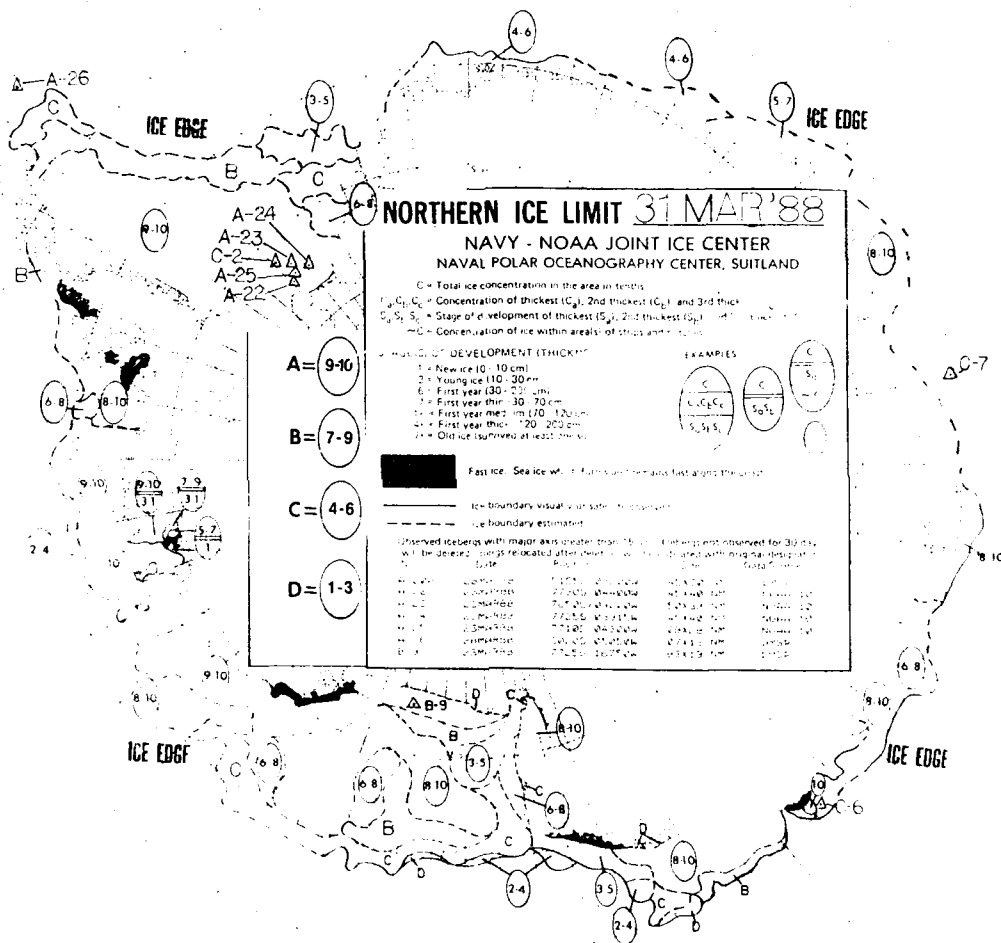
SEA ICE FREE



SEA ICE FREE

Δ-A-20A

SEA ICE FREE

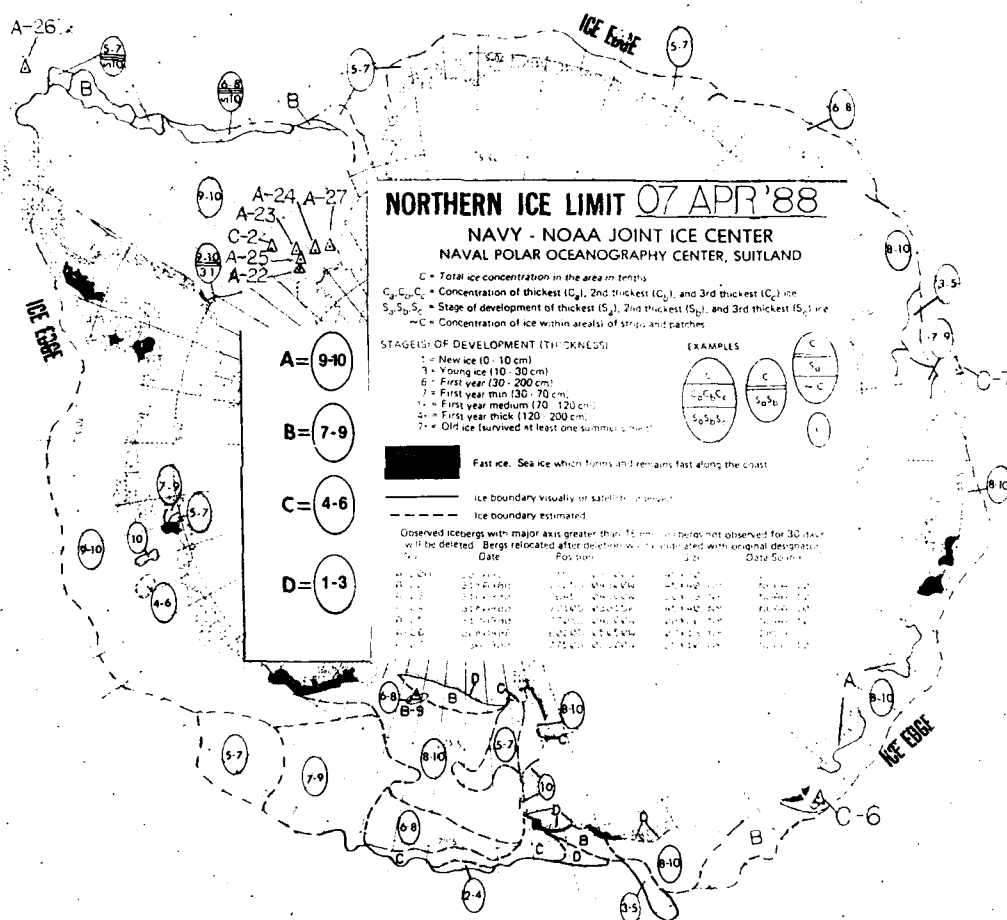


SEA ICE FREE

5375

50°N

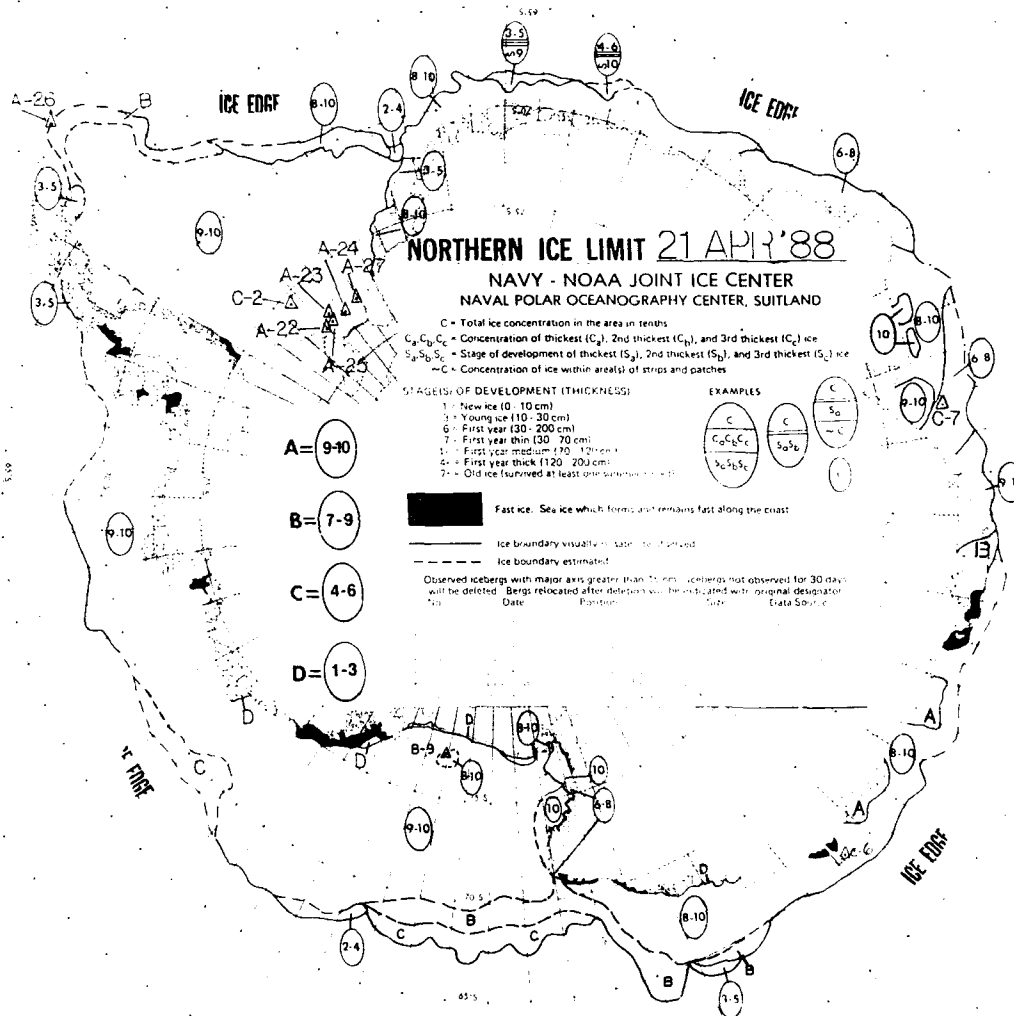
SEA ICE FREE

[illegible]

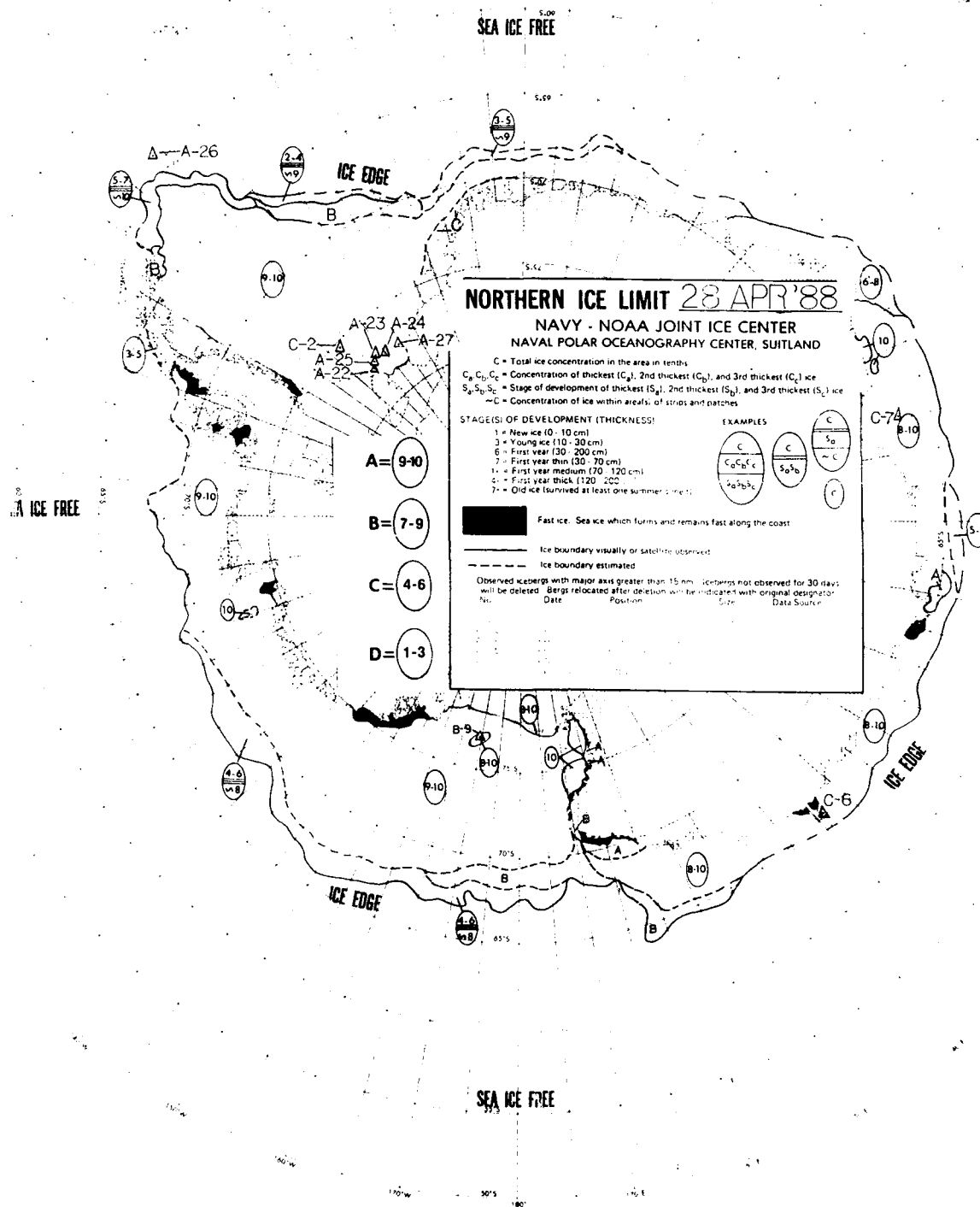
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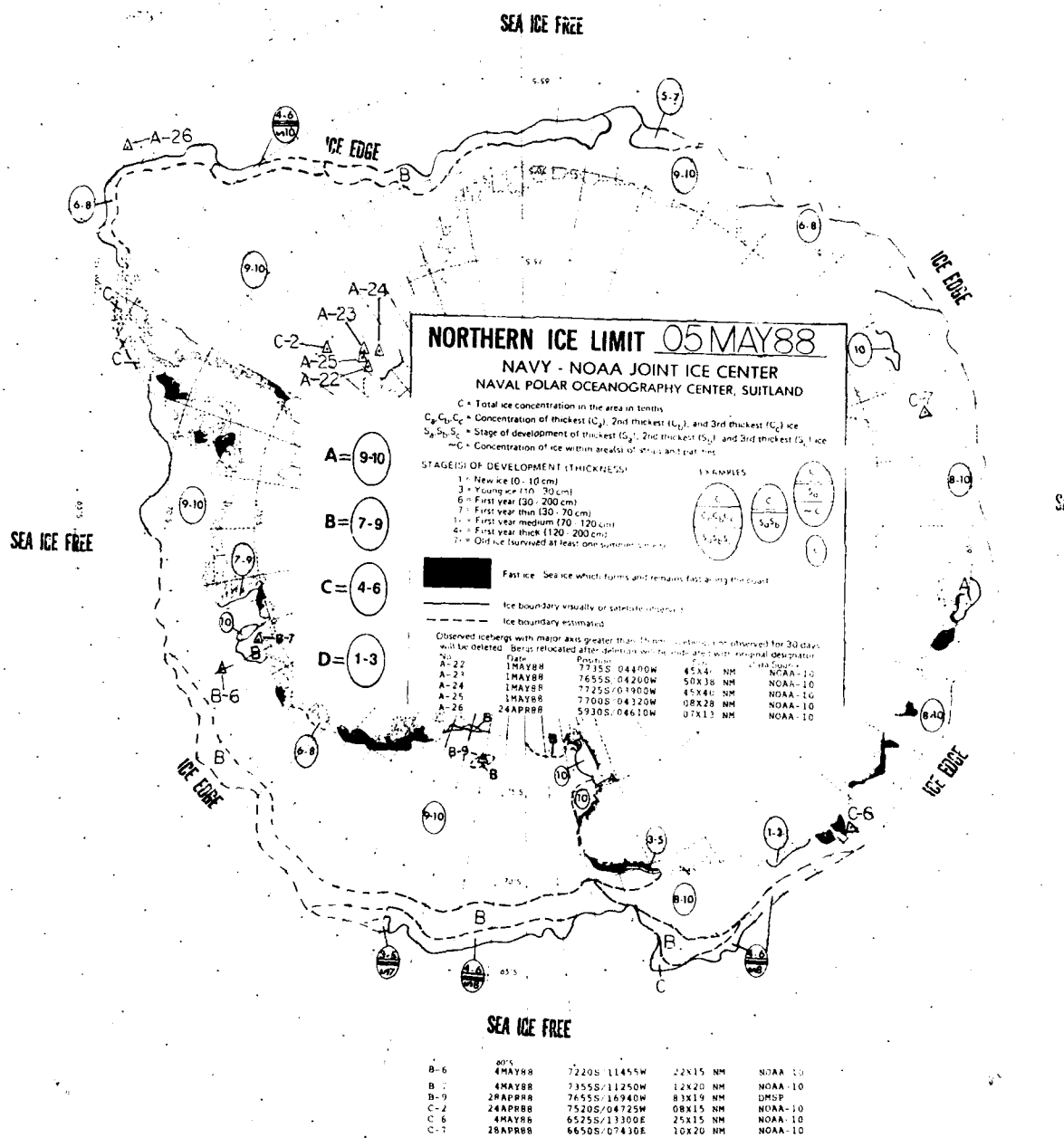
Δ-A-20A

SEA ICE FRONT



SEA ICE FRONT

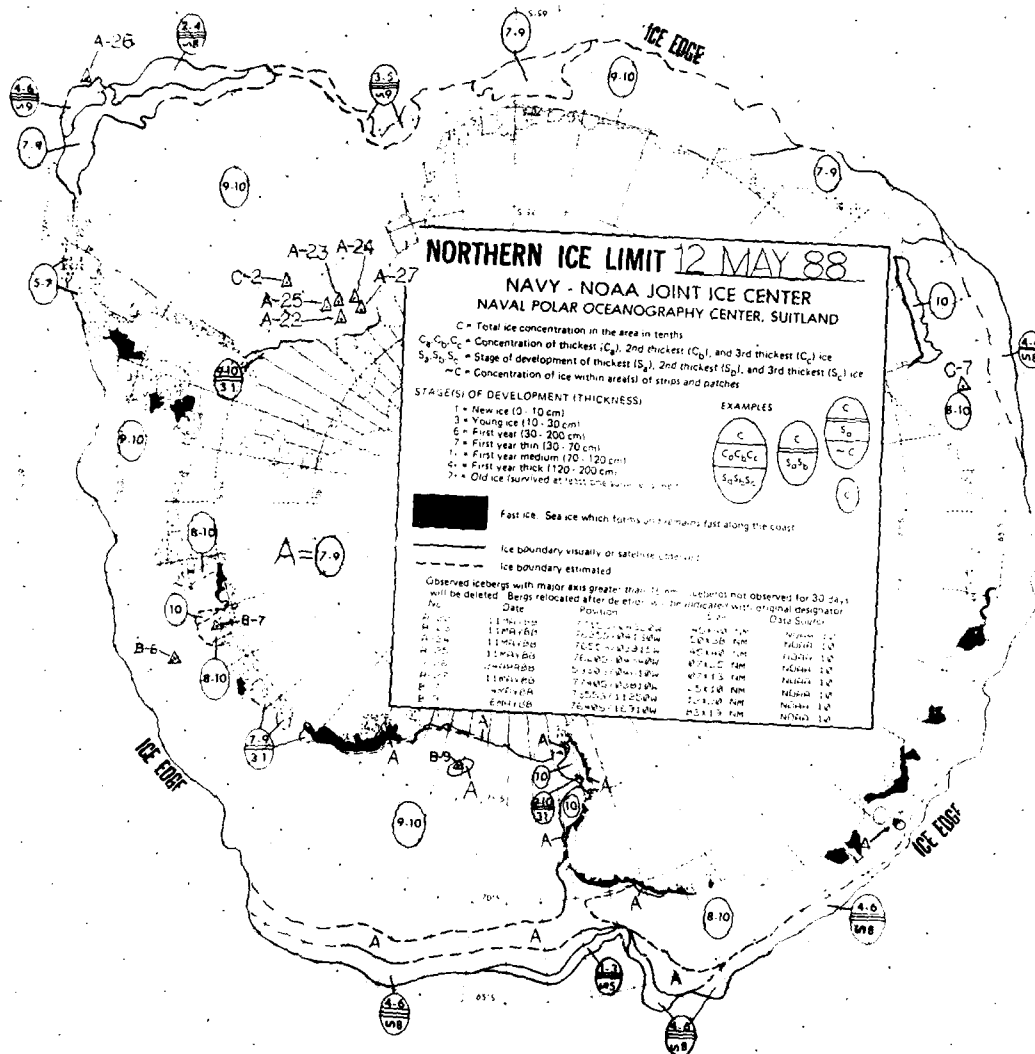




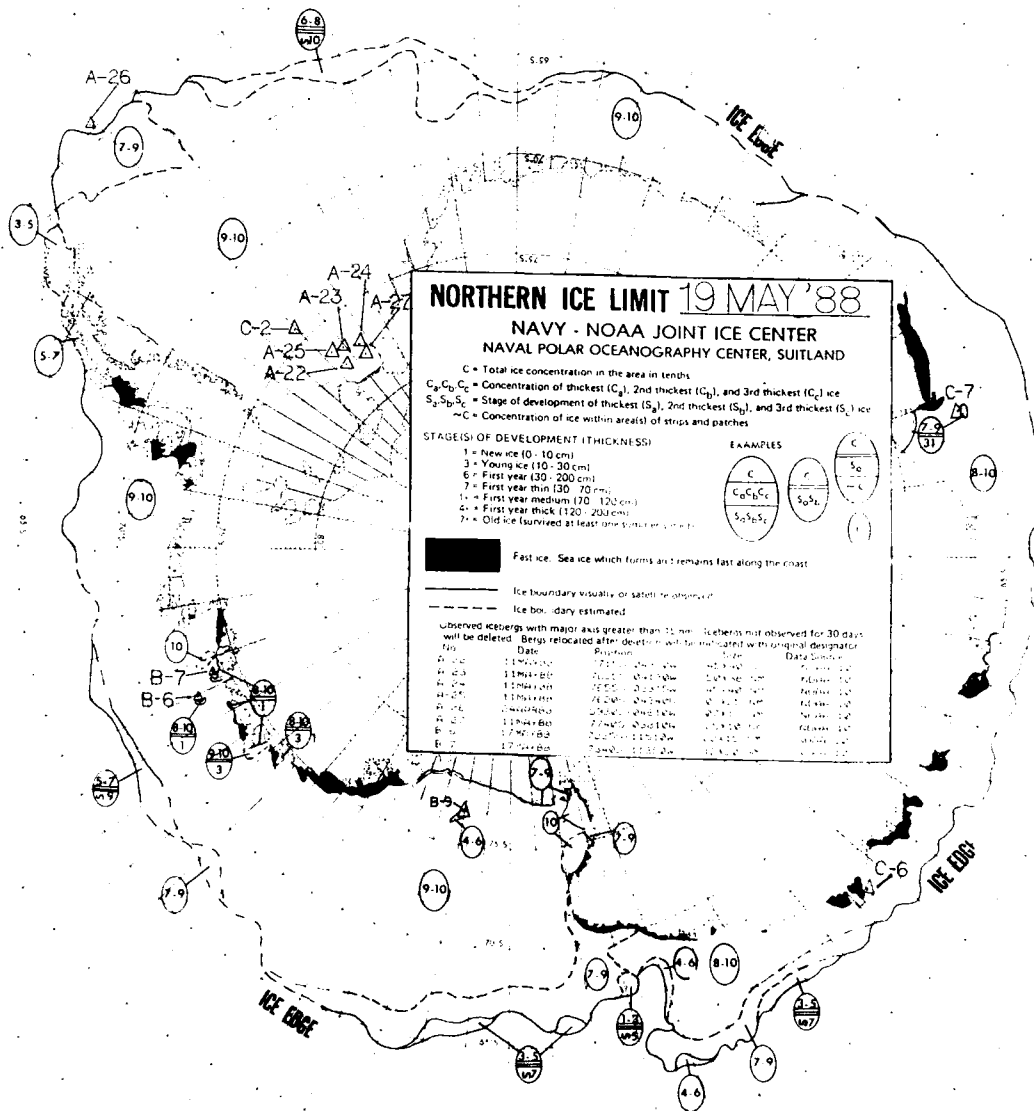
SEA ICE FREE

SEA ICE FREE

SEA ICE FREE



SEA ICE FREE



NORTHERN ICE LIMIT 19 MAY '88

NAVY - NOAA JOINT ICE CENTER
NAVAL POLAR OCEANOGRAPHY CENTER, SUITLAND

C = Total ice concentration in the area in tenths
 C₁ C₂ C₃ = Concentration of thickest (C₁), 2nd thickest (C₂), and 3rd thickest (C₃) ice
 S₁ S₂ S₃ = Stage of development of thickest (S₁), 2nd thickest (S₂), and 3rd thickest (S₃) ice
 -C- = Concentration of ice within areas of strips and patches

STAGES OF DEVELOPMENT (THICKNESS)

- 1 = New ice (0 - 10 cm)
- 3 = Young ice (10 - 30 cm)
- 6 = First year (30 - 200 cm)
- 7 = First year thin (30 - 70 cm)
- 1 = First year medium (70 - 120 cm)
- 2 = First year thick (120 - 200 cm)
- 7 = Old ice (survived at least one summer cycle)

EXAMPLES

C	C ₁	C ₂	C ₃
S ₁	S ₂	S ₃	

Fast ice: Sea ice which forms and remains fast along the coast

Ice boundary visually or satellite observed

Ice boundary visually estimated

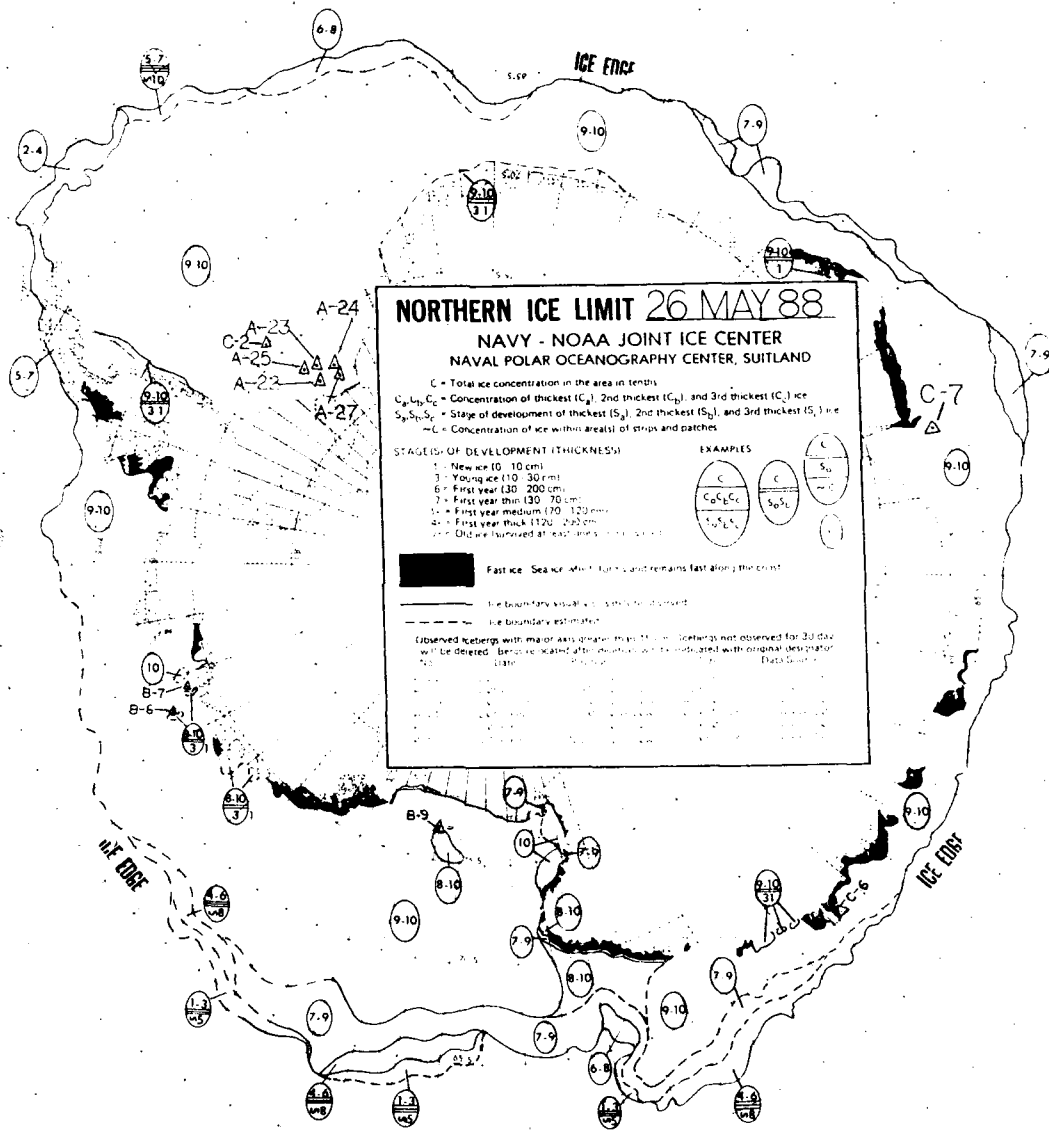
Observed icebergs with major axis greater than 11 m. Icebergs not observed for 30 days will be deleted. Bergs relocated after deletion will be indicated with original designator.

Date	Position	Size	Data Source
11 May 88	72° 15' N 15° 15' W	100 m x 100 m	NAO
11 May 88	72° 15' N 15° 15' W	100 m x 100 m	NAO
11 May 88	72° 15' N 15° 15' W	100 m x 100 m	NAO
11 May 88	72° 15' N 15° 15' W	100 m x 100 m	NAO
11 May 88	72° 15' N 15° 15' W	100 m x 100 m	NAO
11 May 88	72° 15' N 15° 15' W	100 m x 100 m	NAO
11 May 88	72° 15' N 15° 15' W	100 m x 100 m	NAO
11 May 88	72° 15' N 15° 15' W	100 m x 100 m	NAO
11 May 88	72° 15' N 15° 15' W	100 m x 100 m	NAO
11 May 88	72° 15' N 15° 15' W	100 m x 100 m	NAO

SEA ICE FREE

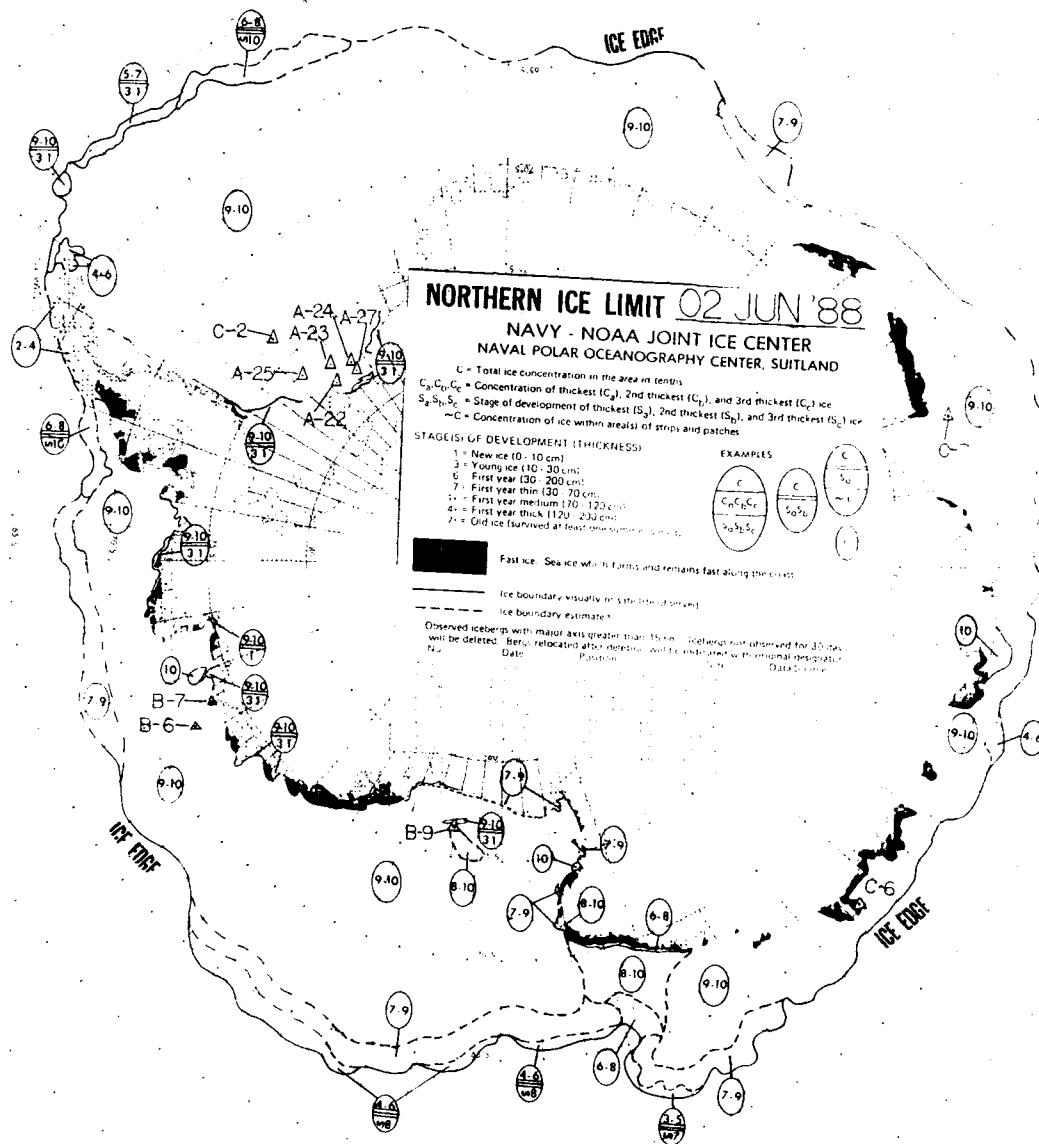
5.06

5.09

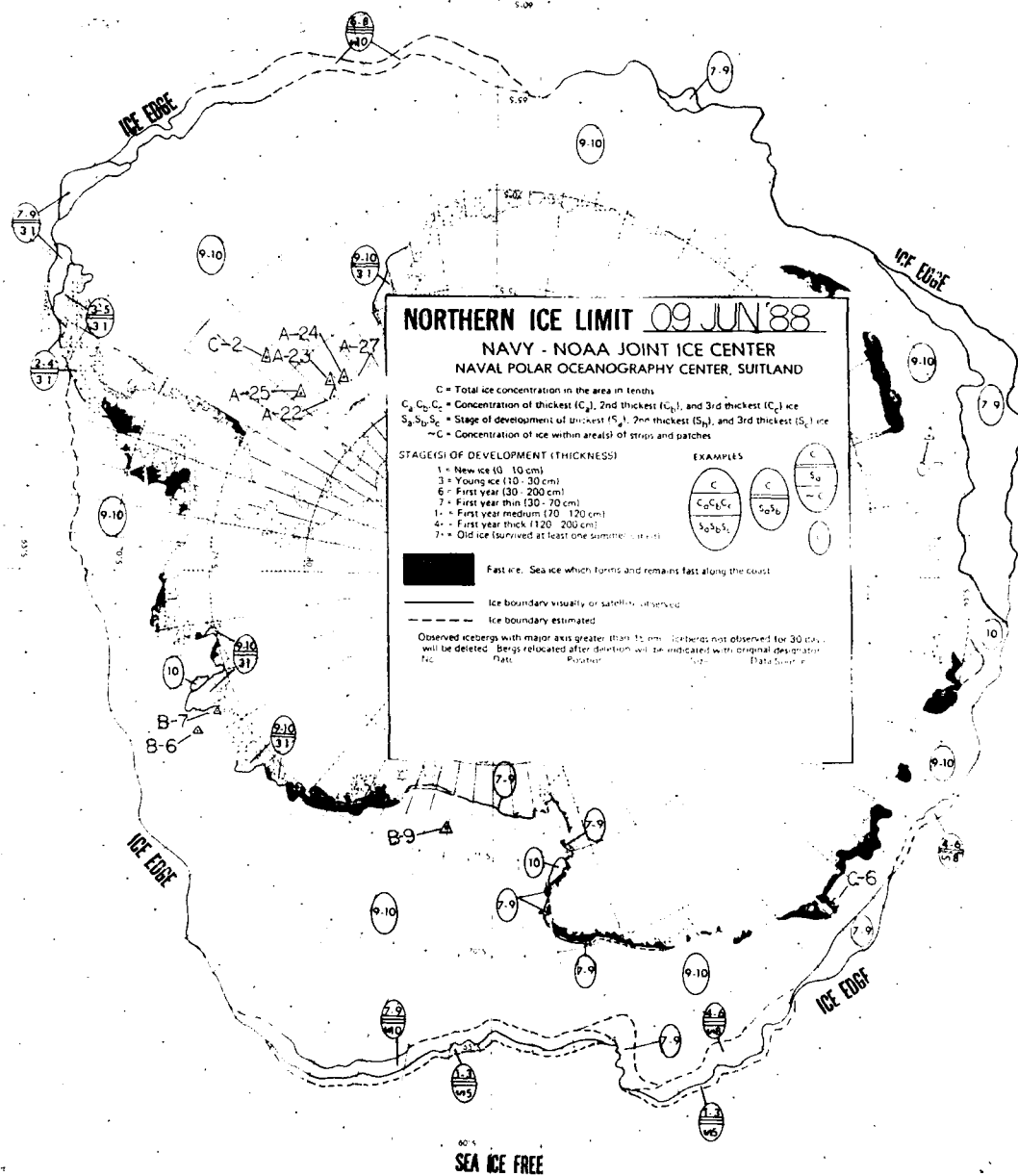


SEA ICE FREE

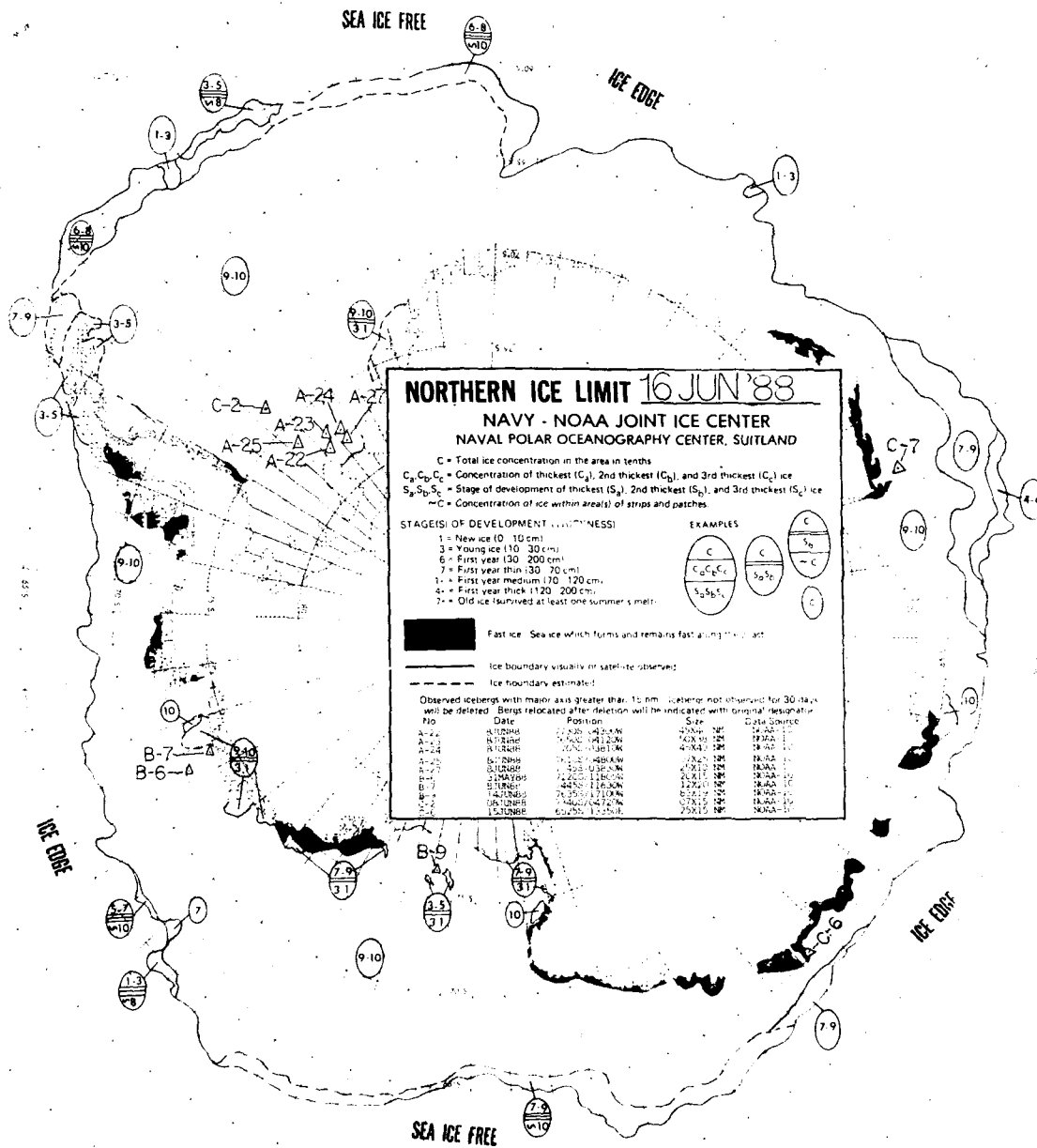
SEA ICE FREE

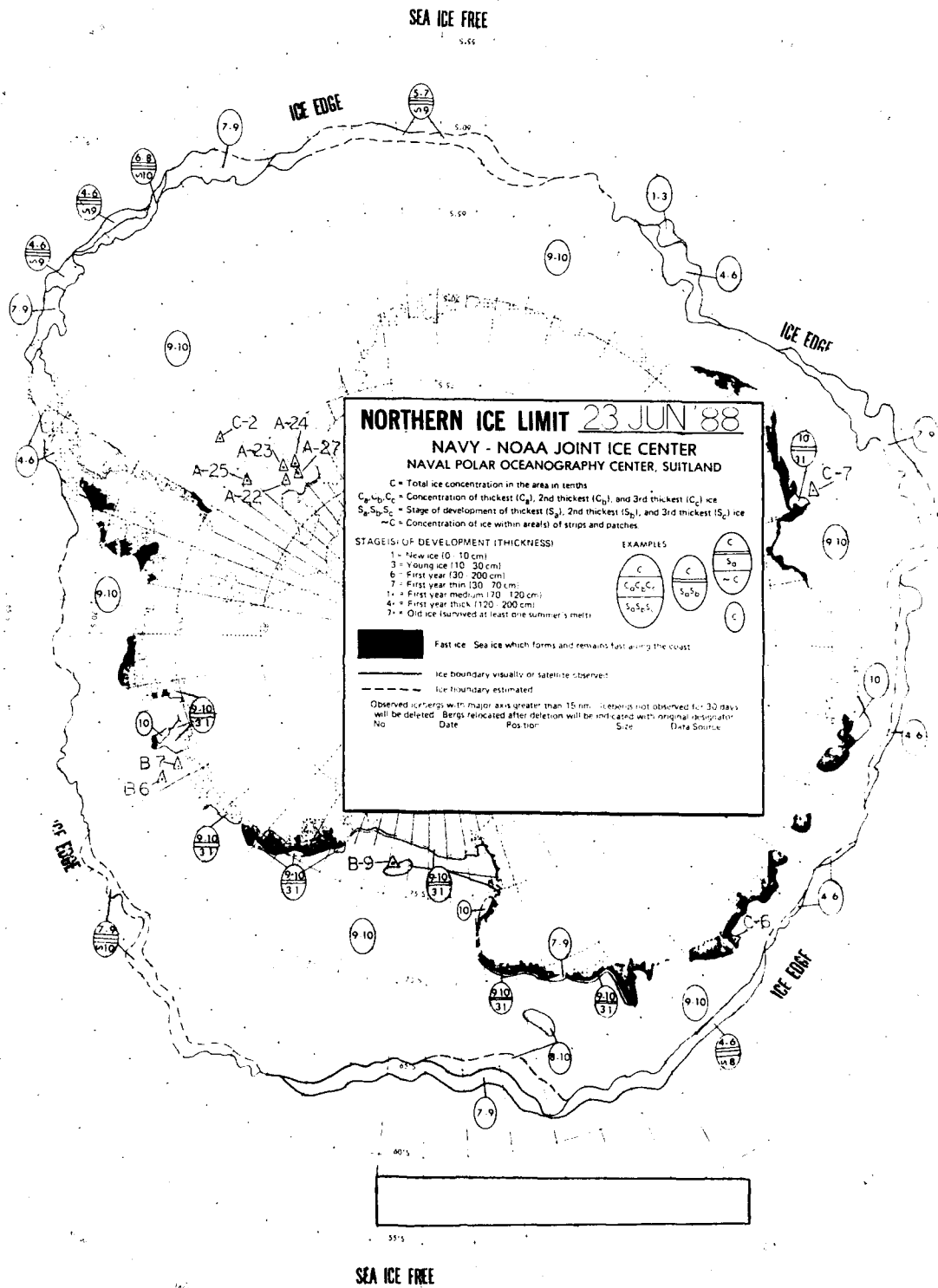


SEA ICE FREE



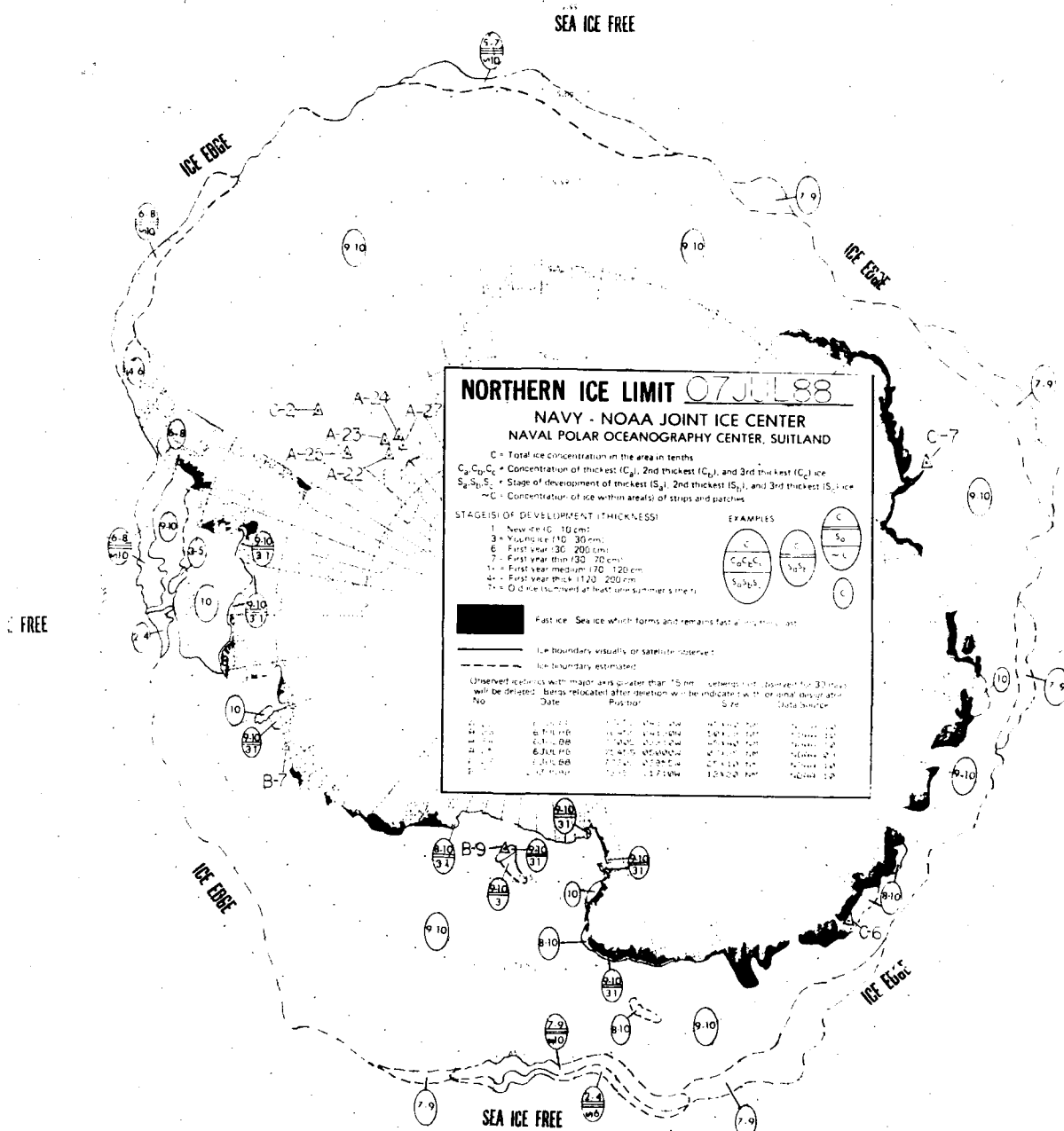
SEA ICE FREE



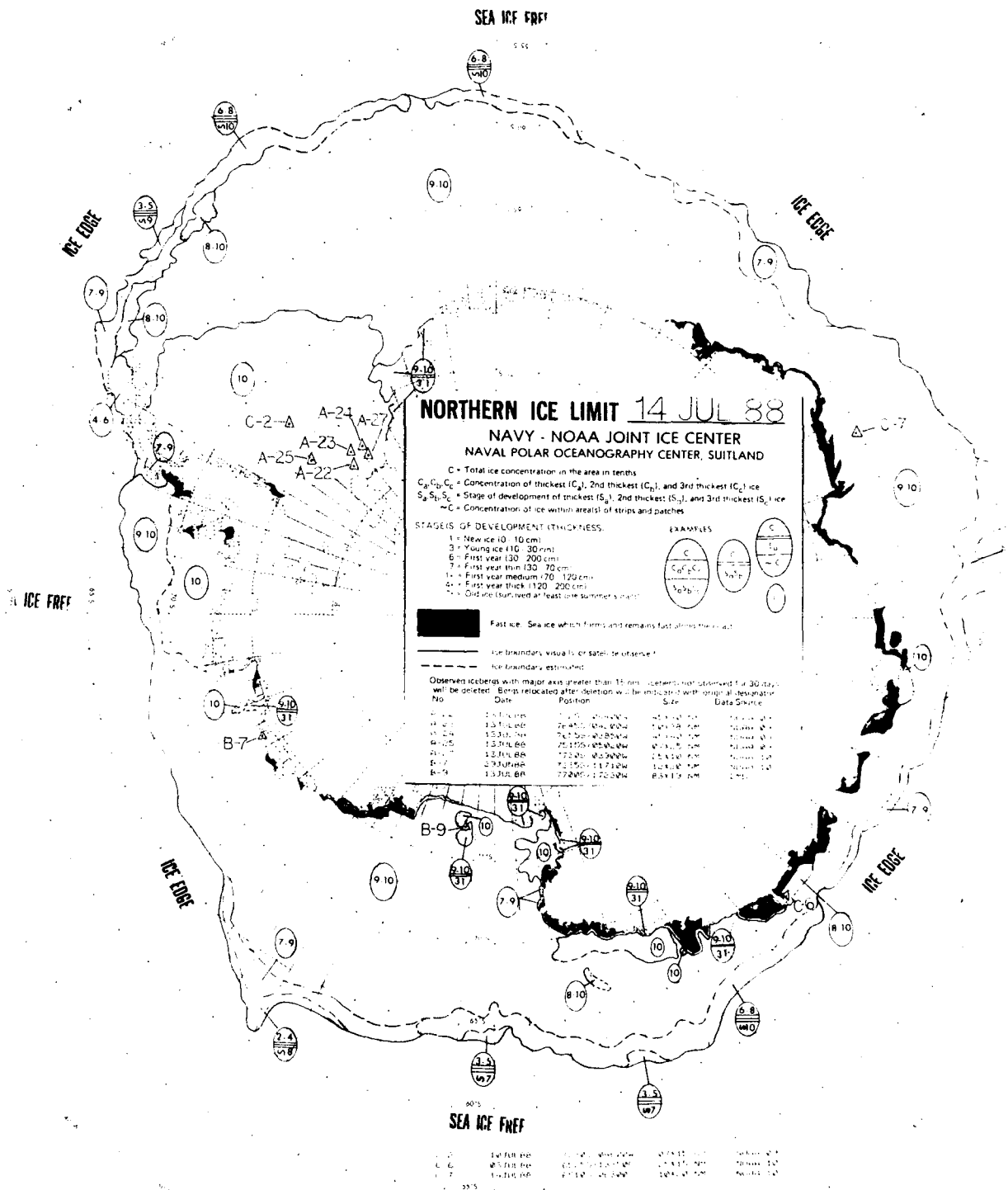


5.55

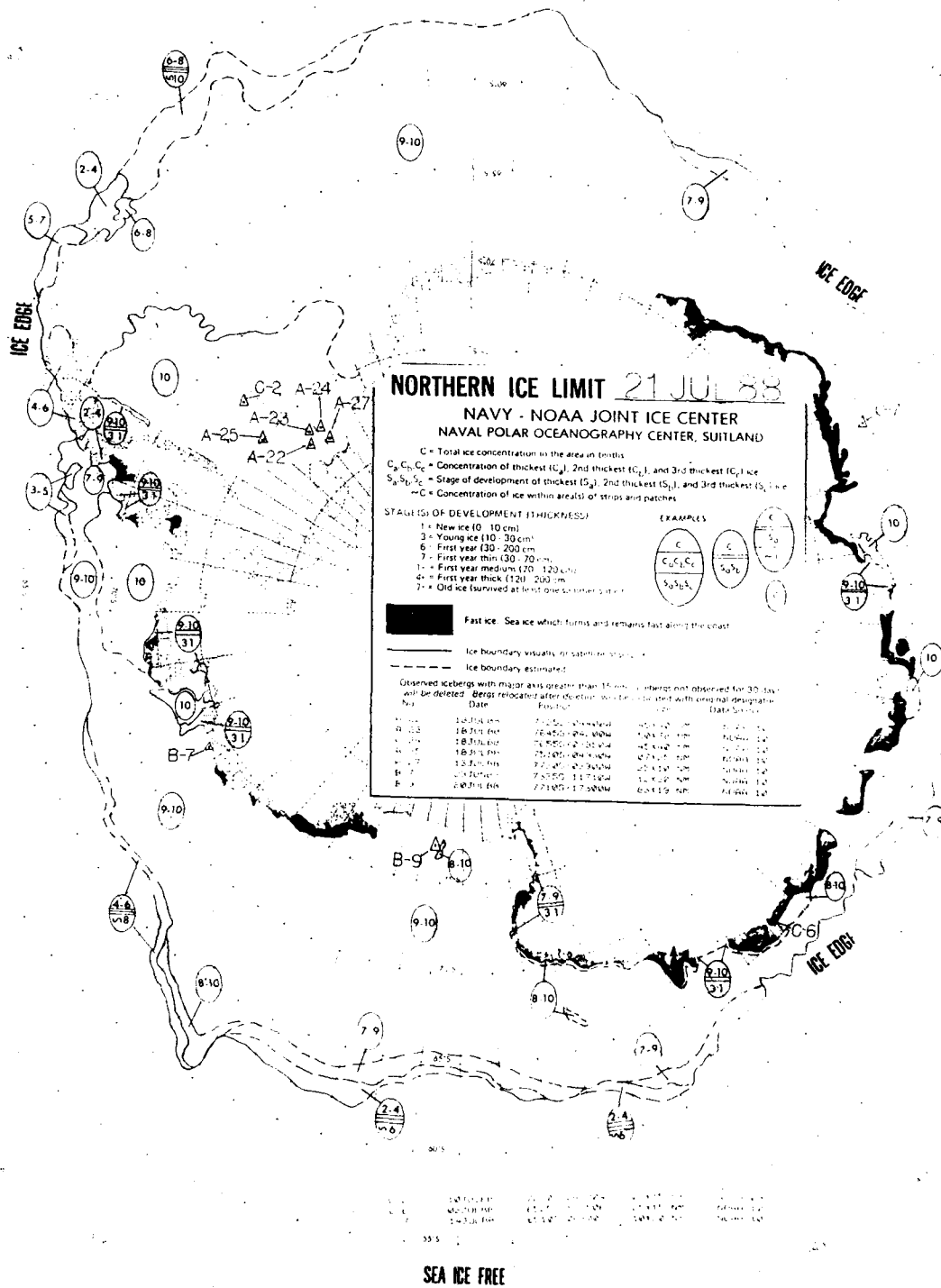




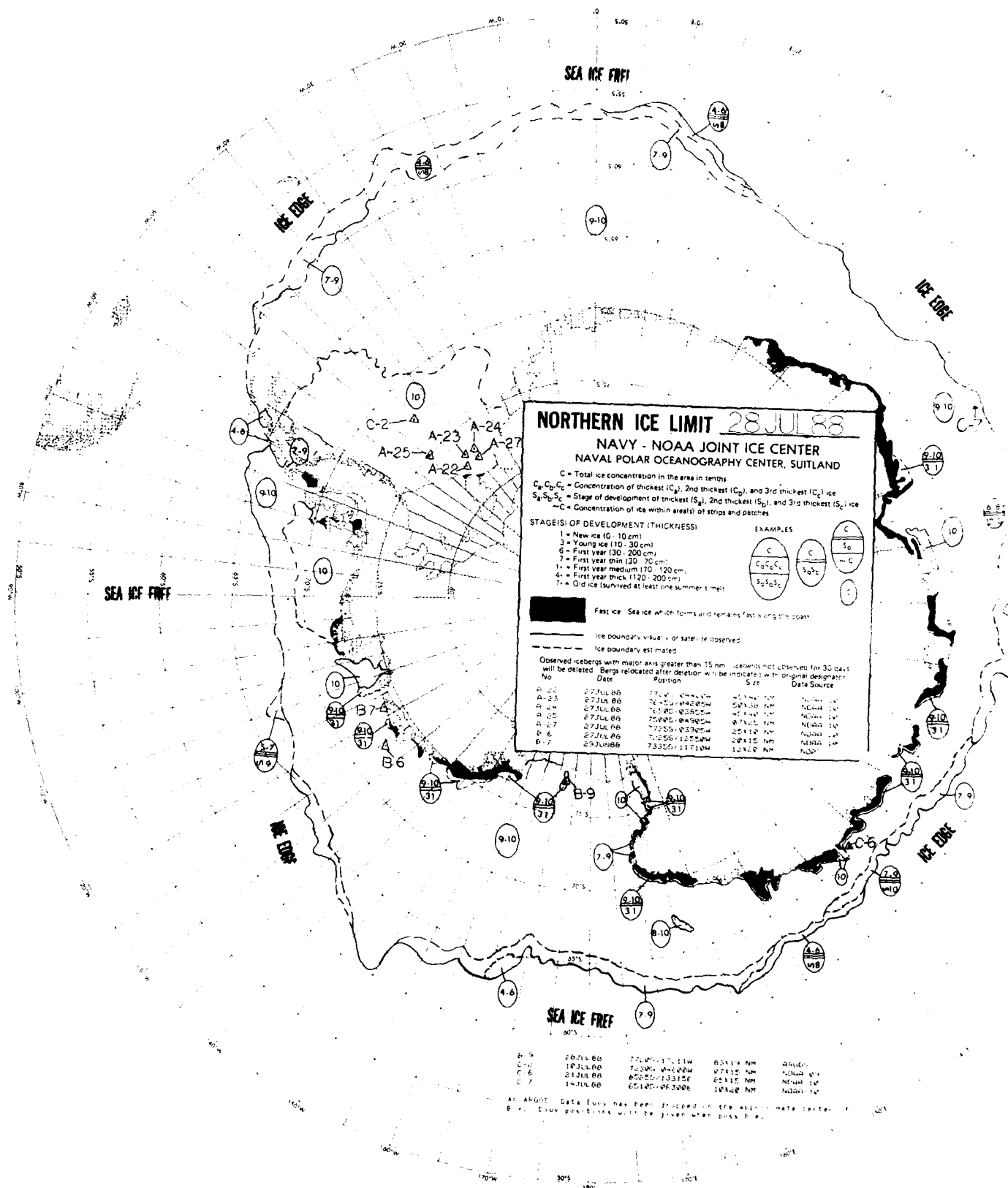
1. 1000000 km²
 2. 1000000 km²
 3. 1000000 km²
 4. 1000000 km²
 5. 1000000 km²
 6. 1000000 km²
 7. 1000000 km²

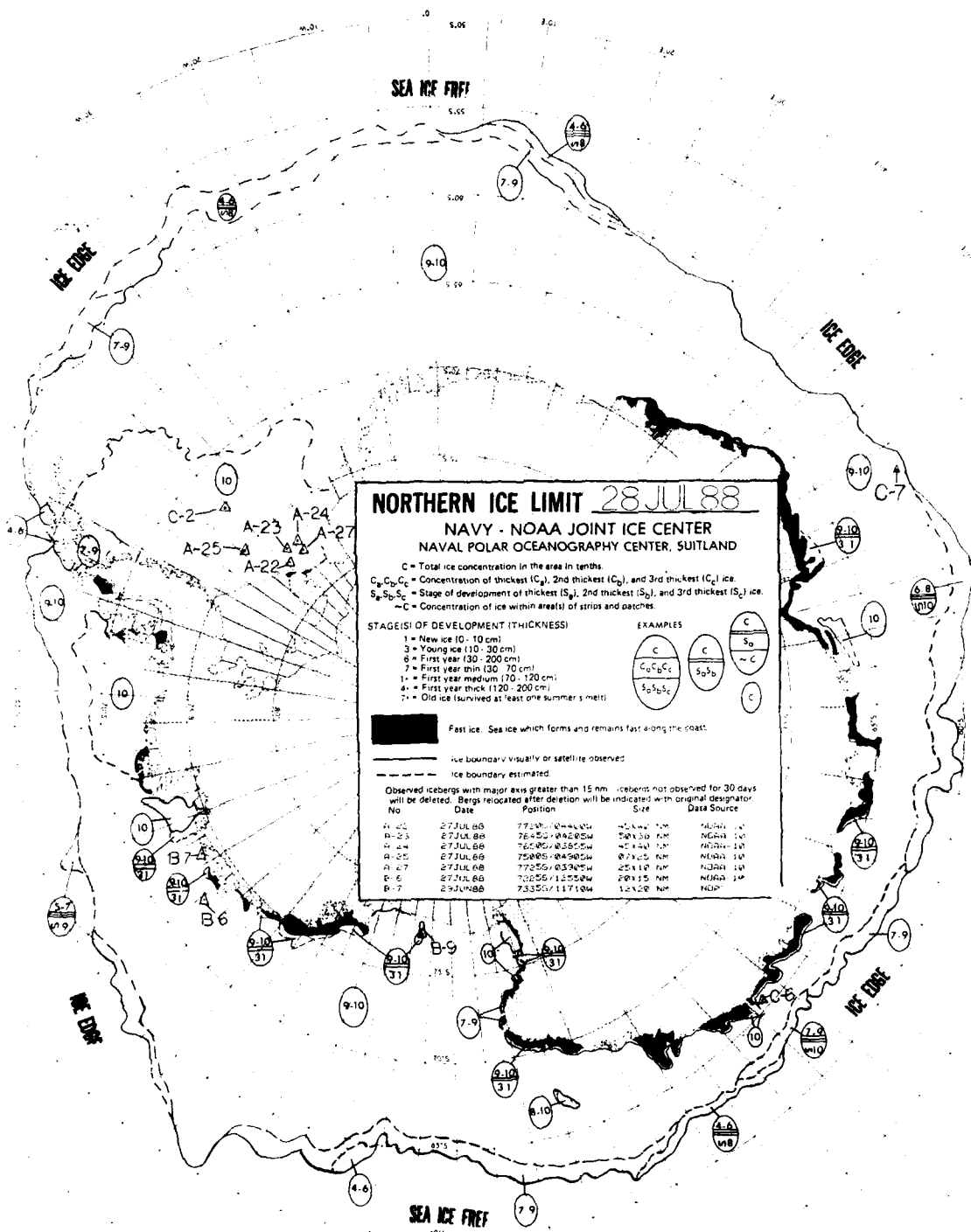


SEA ICE FREE



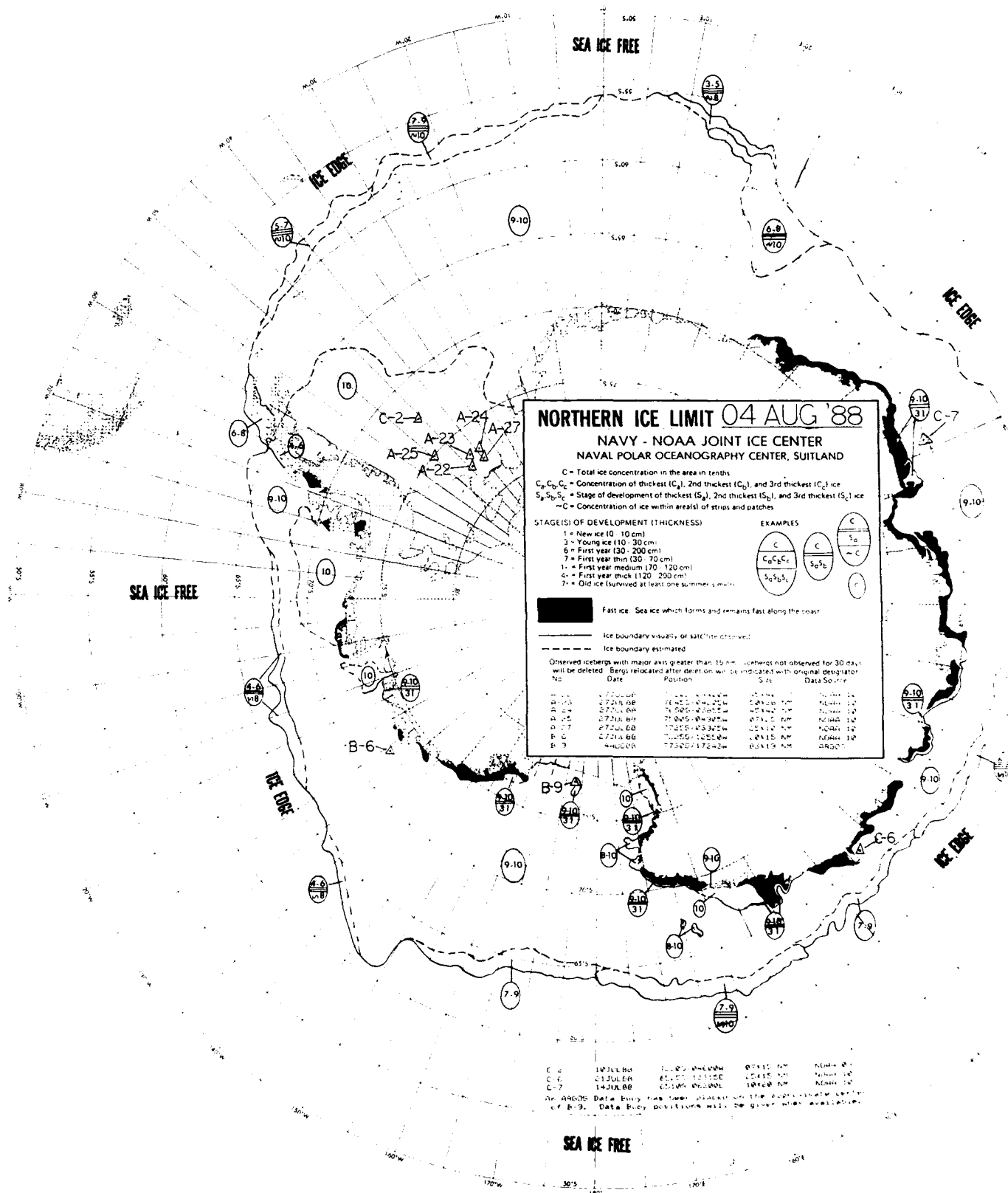
SEA ICE FREE

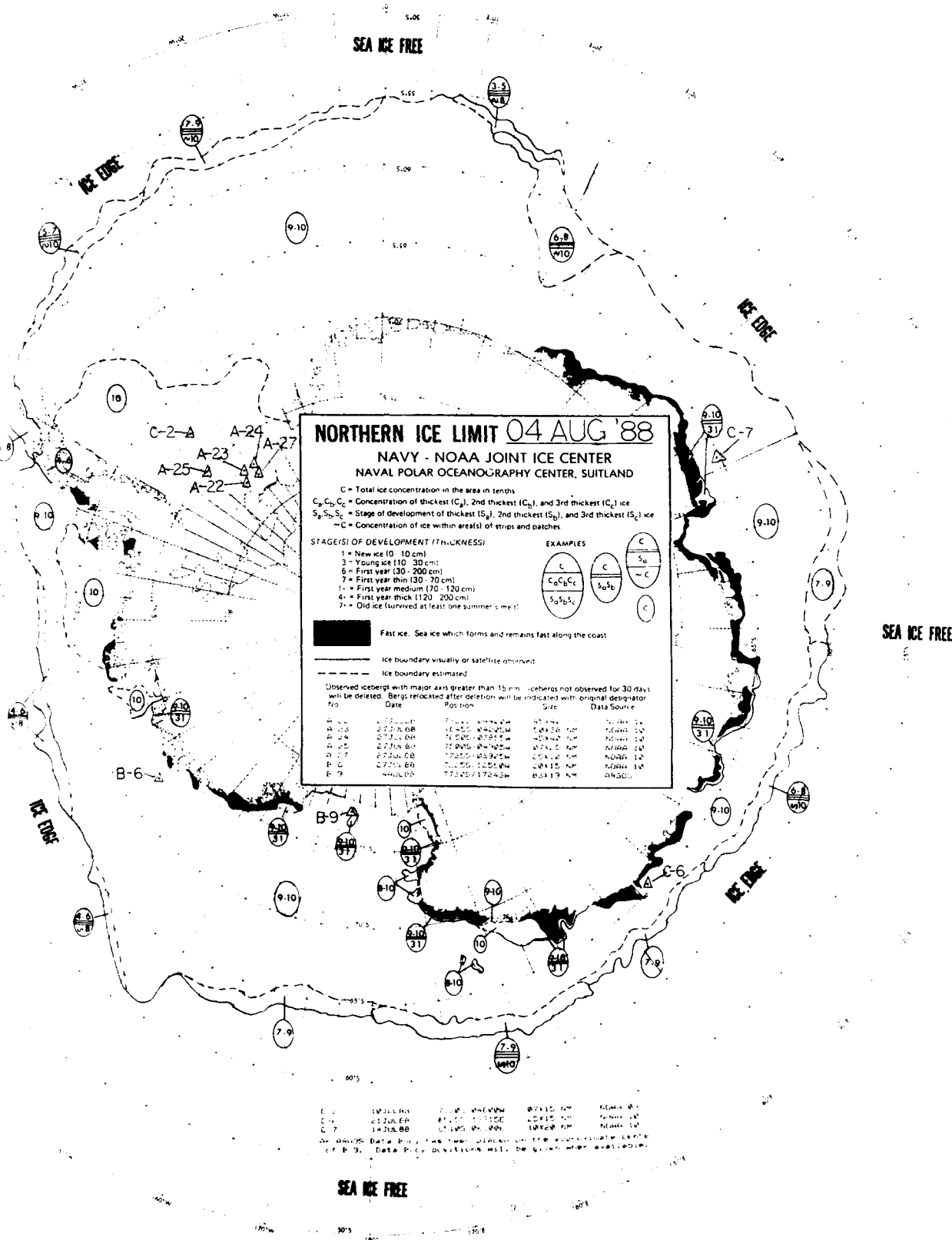


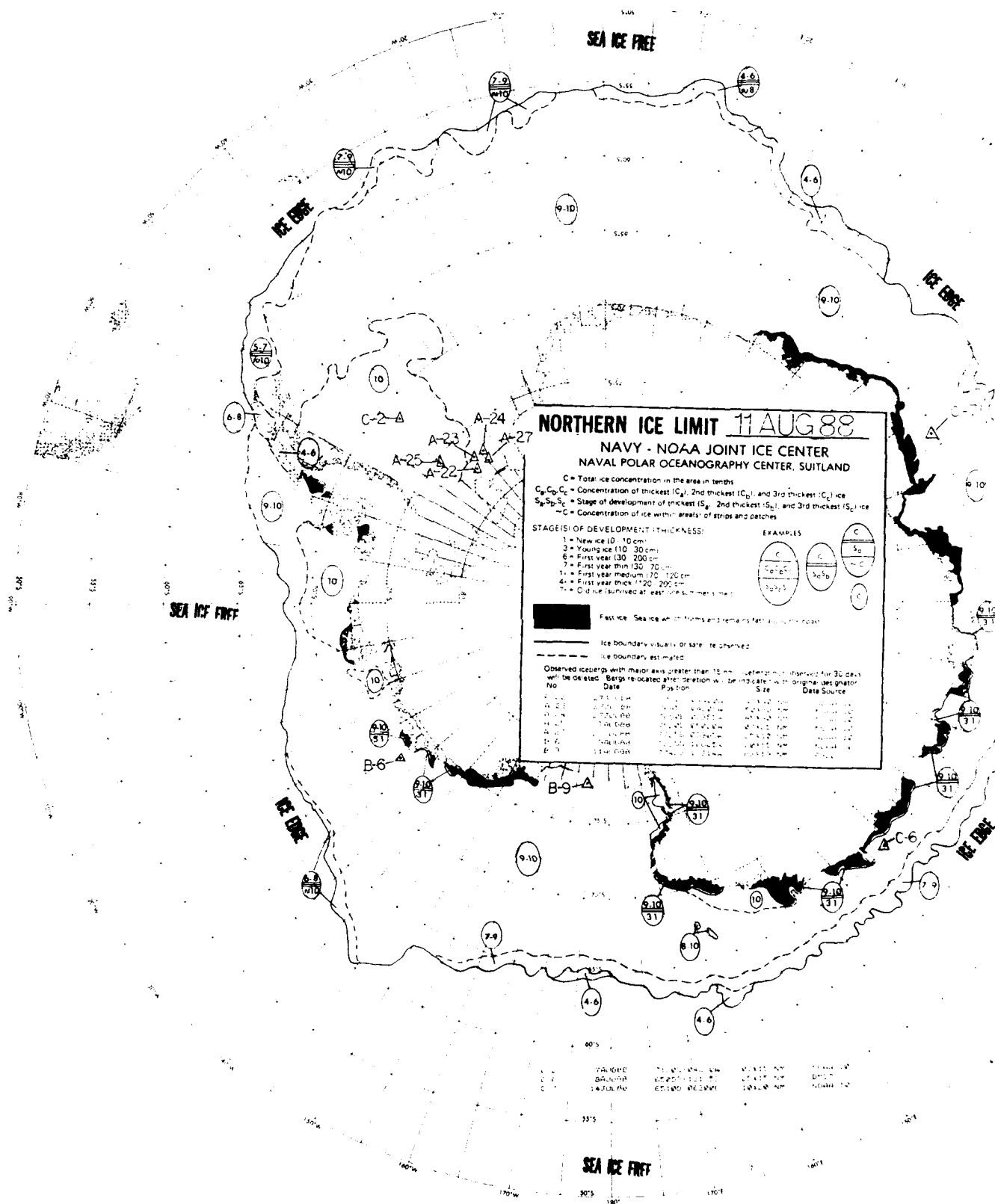


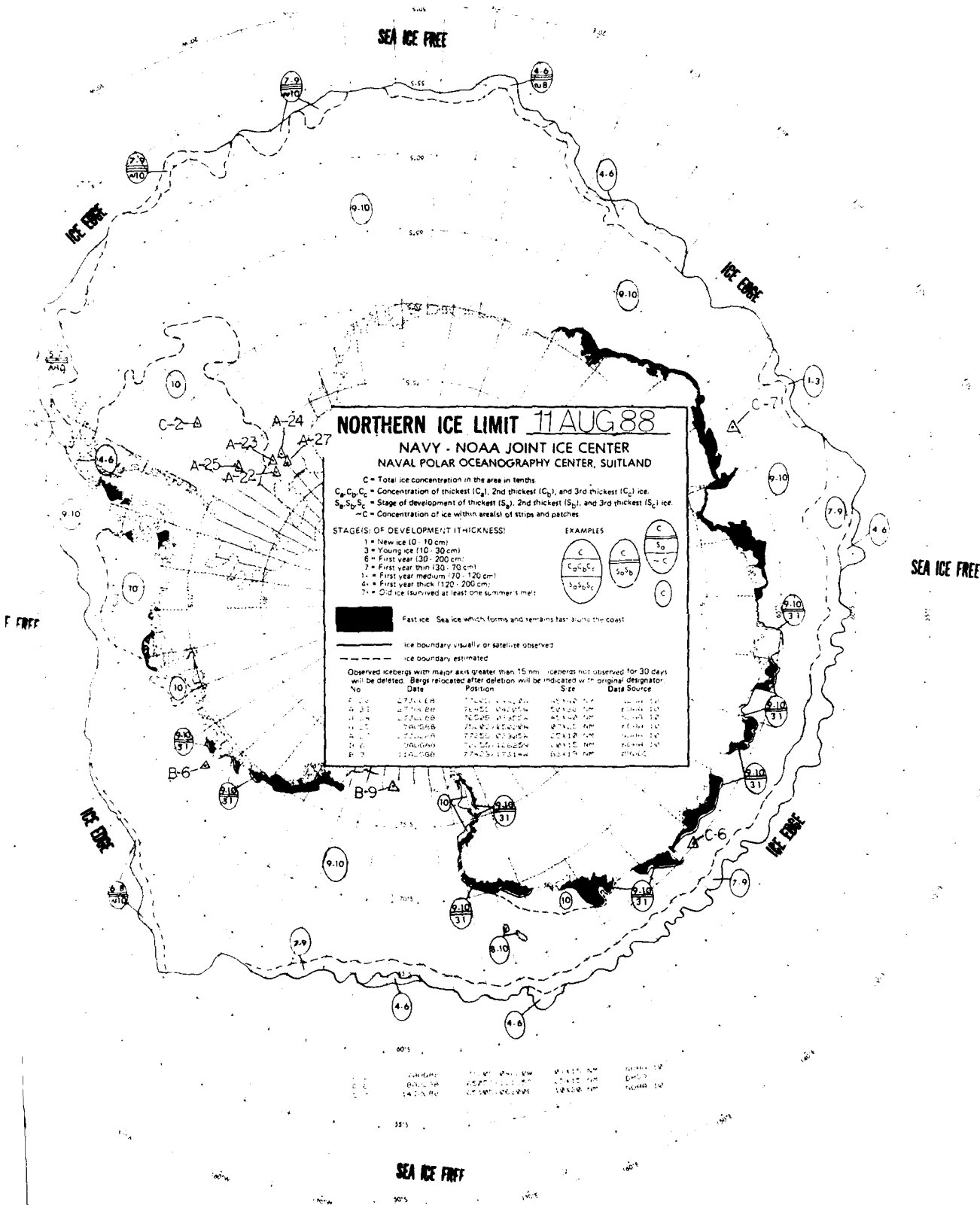
B-1	26 JUL 88	71°45'N 172°15'W	85x15 NM	NADP
B-2	26 JUL 88	70°05'N 174°05'W	27x15 NM	NADP
B-3	27 JUL 88	65°05'N 133°15'W	25x15 NM	NADP
B-4	27 JUL 88	65°10'N 133°05'W	10x20 NM	NADP

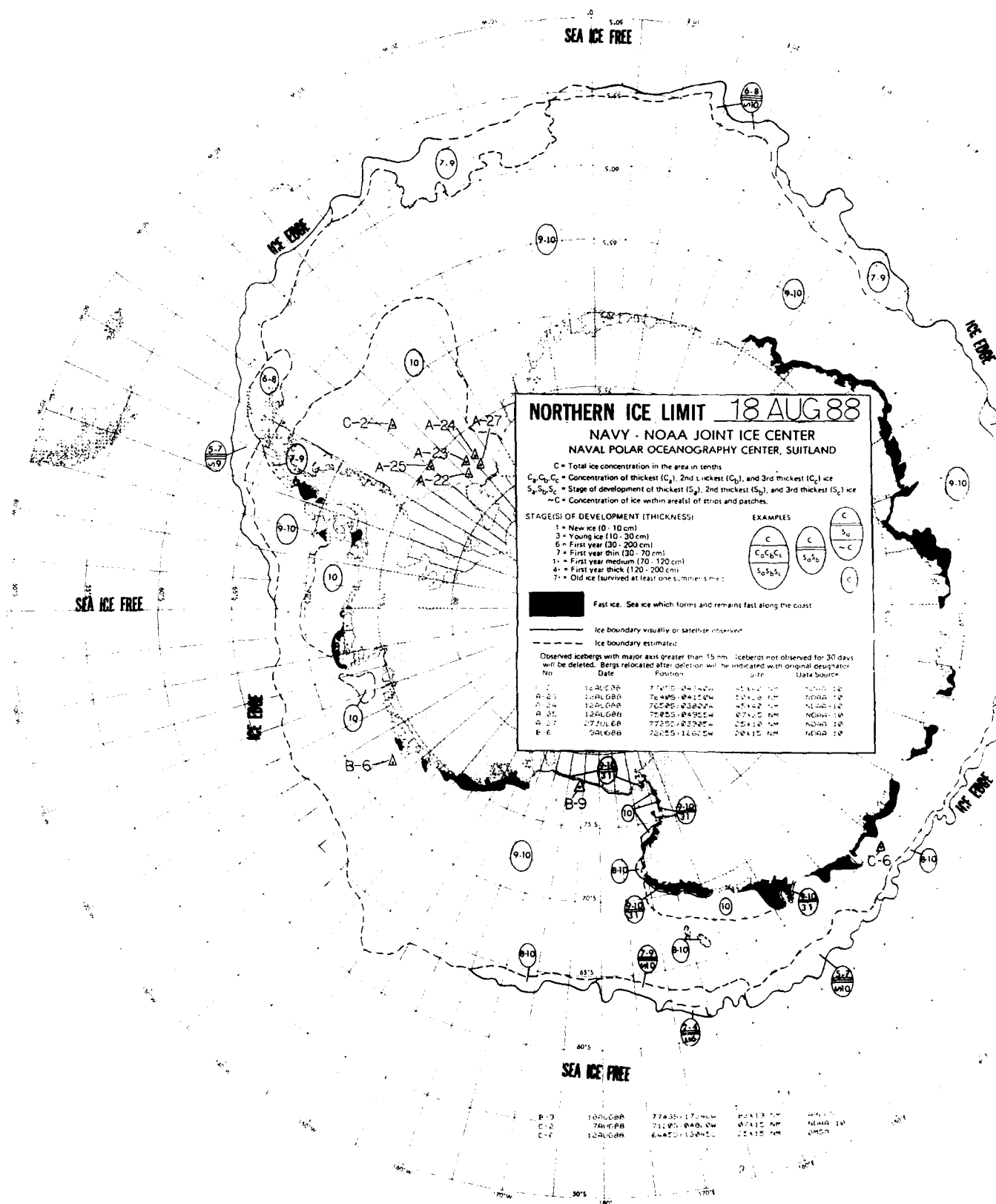
As shown, data is a fax over. Stripped in the appropriate center of the map. Data is a fax over. Stripped in the appropriate center of the map.

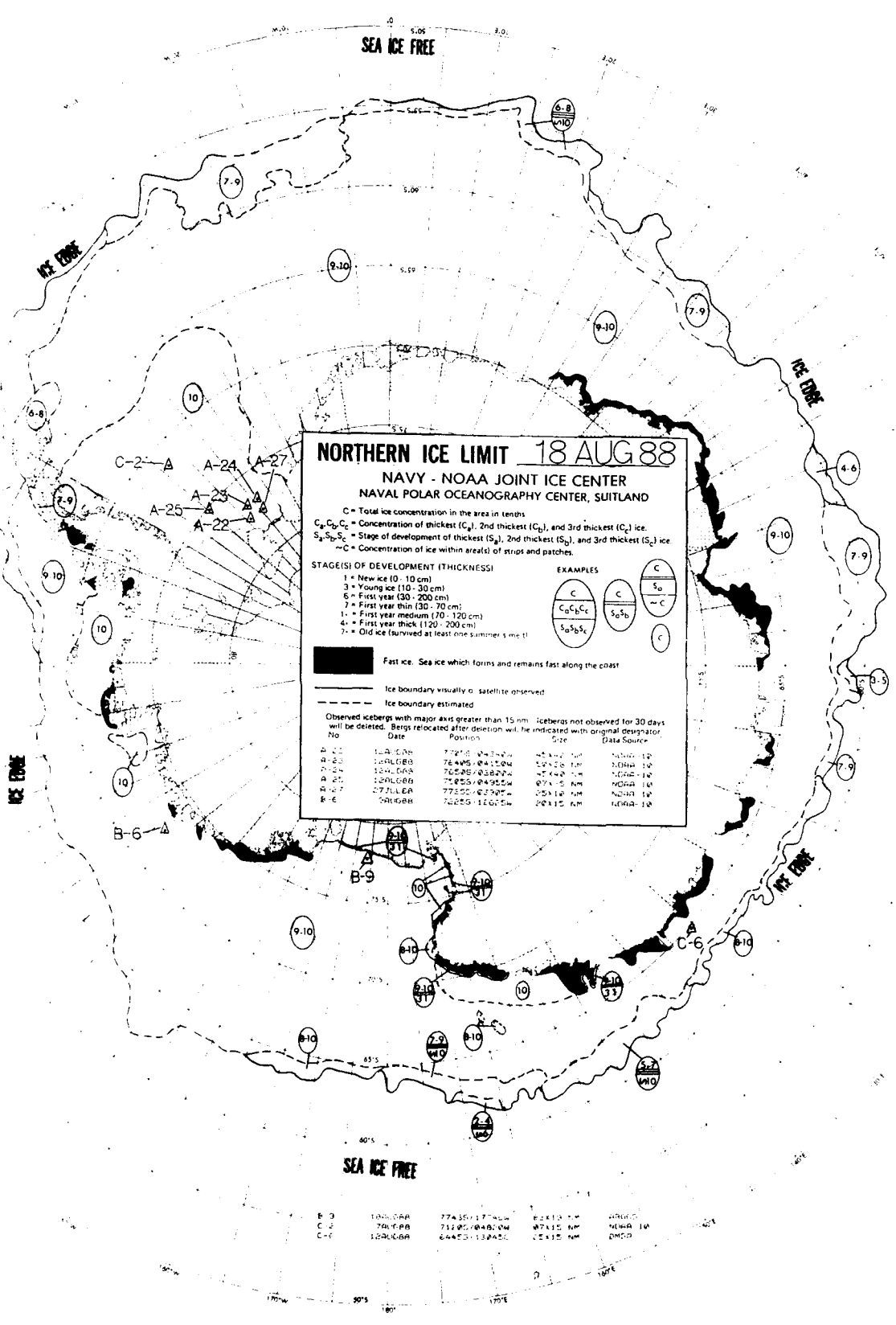












NORTHERN ICE LIMIT 18 AUG 88

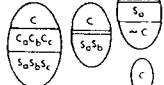
**NAVY - NOAA JOINT ICE CENTER
NAVAL POLAR OCEANOGRAPHY CENTER, SUITLAND**

C = Total ice concentration in the area in tenths
 C_1, C_2, C_3 = Concentration of thickest (C_1), 2nd thickest (C_2), and 3rd thickest (C_3) ice.
 S_1, S_2, S_3 = Stage of development of thickest (S_1), 2nd thickest (S_2), and 3rd thickest (S_3) ice.
 -C = Concentration of ice within area(s) of strips and patches.

STAGE(S) OF DEVELOPMENT (THICKNESS)

- 1 = New ice (10 - 10 cm)
- 3 = Young ice (10 - 30 cm)
- 6 = First year thin (30 - 200 cm)
- 7 = First year thin (30 - 70 cm)
- 1 = First year medium (70 - 120 cm)
- 4 = First year thick (120 - 200 cm)
- 7 = Old ice (survived at least one summer's melt)

EXAMPLES



Fast ice: Sea ice which forms and remains fast along the coast

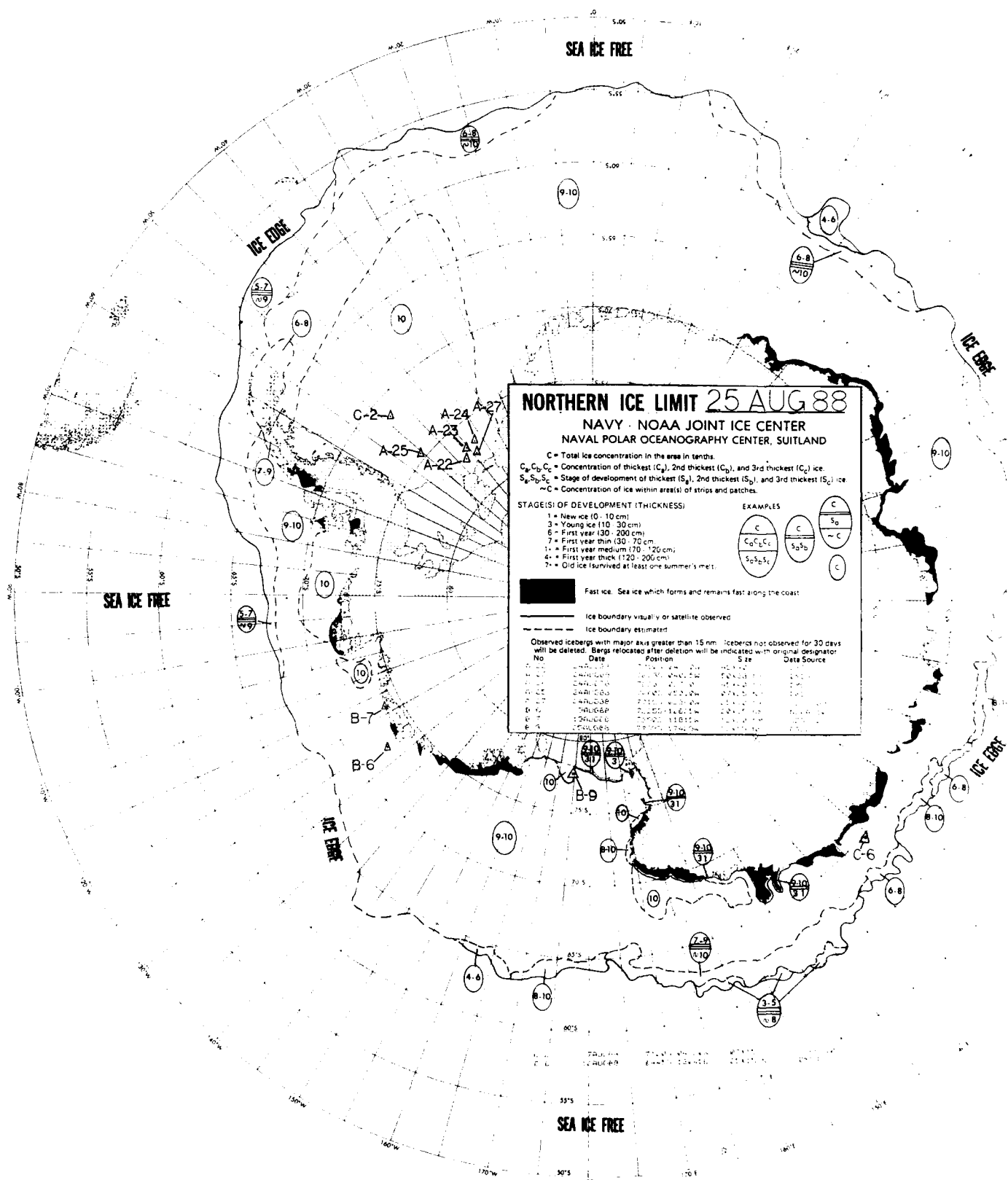
Ice boundary visually or satellite observed

Ice boundary estimated

Observed icebergs with major axis greater than 15 nm. Icebergs not observed for 30 days will be deleted. Bergs relocated after deletion will be indicated with original designator.

No	Date	Position	Size	Data Source
A-21	14 AUG 88	77°15'N 15°45'W	45 x 20 nm	NOAA-10
A-22	14 AUG 88	76°45'N 15°04'W	15 x 20 nm	NOAA-10
A-23	14 AUG 88	76°05'N 15°02'W	17 x 40 nm	NOAA-10
A-24	14 AUG 88	75°05'N 15°05'W	10 x 15 nm	NOAA-10
A-25	14 AUG 88	75°05'N 15°05'W	10 x 15 nm	NOAA-10
A-26	14 AUG 88	75°05'N 15°05'W	10 x 15 nm	NOAA-10
A-27	14 AUG 88	75°05'N 15°05'W	10 x 15 nm	NOAA-10
B-6	14 AUG 88	76°05'N 15°05'W	10 x 15 nm	NOAA-10

B-3	10 AUG 88	77°35'N 17°40'W	10 x 15 nm	NOAA-10
C-2	7 AUG 88	71°05'N 15°05'W	10 x 15 nm	NOAA-10
C-6	10 AUG 88	64°05'N 15°05'W	10 x 15 nm	NOAA-10



SEA ICE FREE

ICE EDGE

ICE EDGE

SEA ICE FREE

ICE EDGE

NORTHERN ICE LIMIT 25 AUG 88

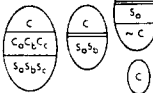
NAVY - NOAA JOINT ICE CENTER
NAVAL POLAR OCEANOGRAPHY CENTER, SUITLAND

C = Total ice concentration in the area in tenths.
C₁C₂C₃ = Concentration of thickest (C₁), 2nd thickest (C₂), and 3rd thickest (C₃) ice.
S₁S₂S₃ = Stage of development of thickest (S₁), 2nd thickest (S₂), and 3rd thickest (S₃) ice.
~C = Concentration of ice within areas of strips and patches.

STAGE(S) OF DEVELOPMENT (THICKNESS)

- 1 = New ice (0 - 10 cm)
- 3 = Young ice (10 - 30 cm)
- 6 = First year (30 - 200 cm)
- 7 = First year thin (30 - 70 cm)
- 1 = First year medium (70 - 120 cm)
- 4 = First year thick (120 - 200 cm)
- 7 = Old ice (survived at least one summer's melt)

EXAMPLES



Fast ice: Sea ice which forms and remains fast along the coast.

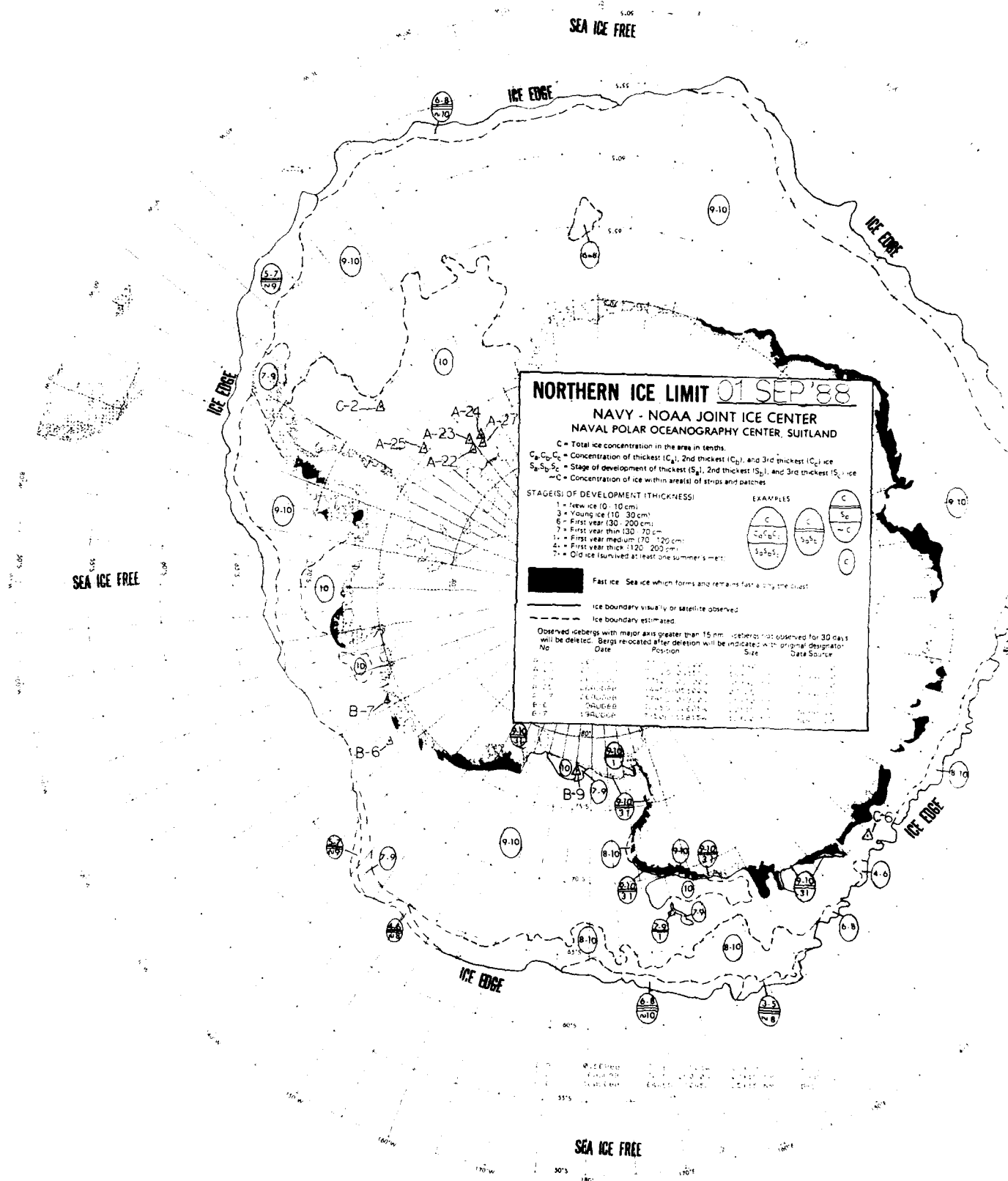
Ice boundary visually or satellite observed

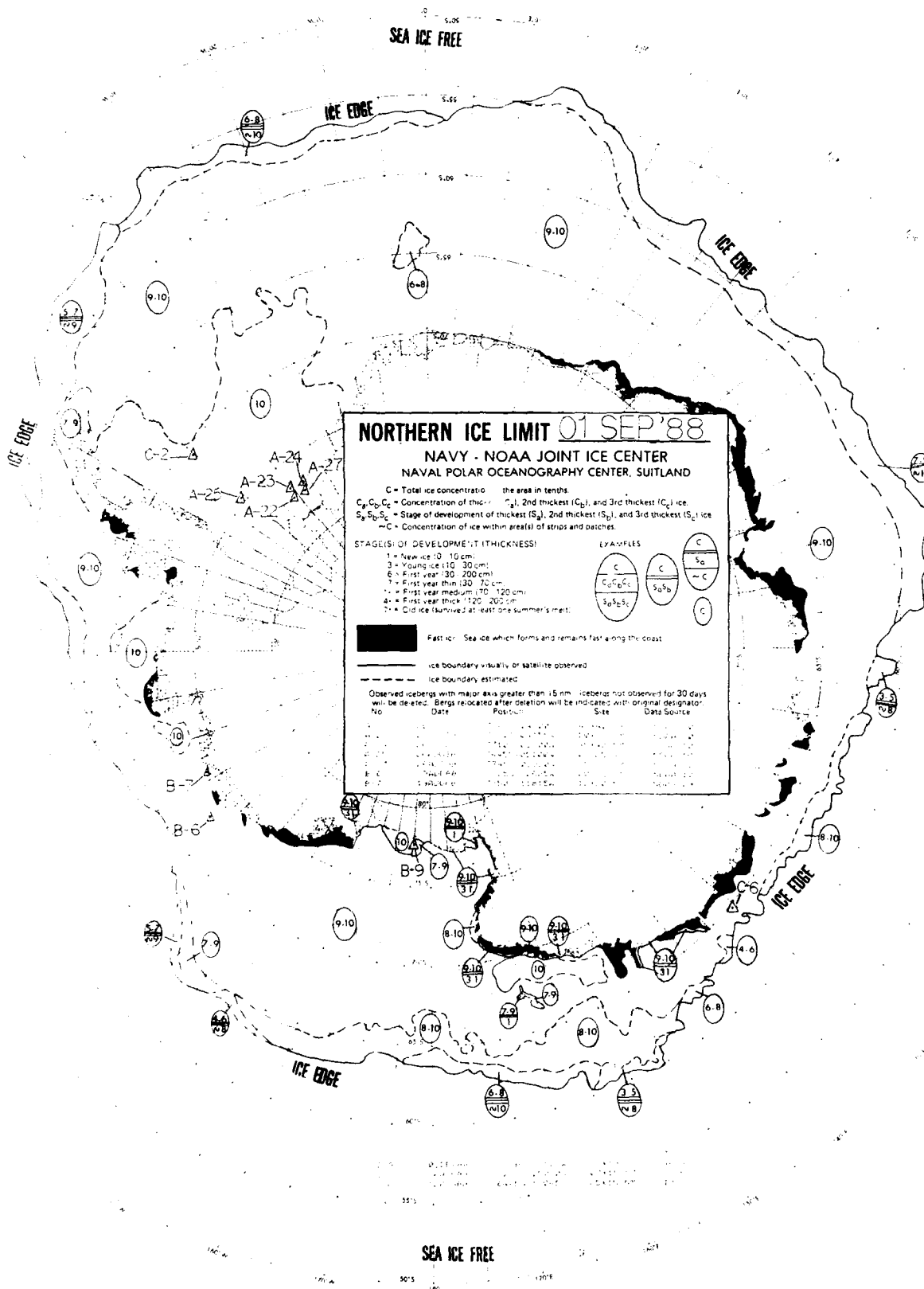
Ice boundary estimated

Observed icebergs with major axis greater than 15 nm. Icebergs not observed for 30 days will be deleted. Bergs relocated after deletion will be indicated with original designator.

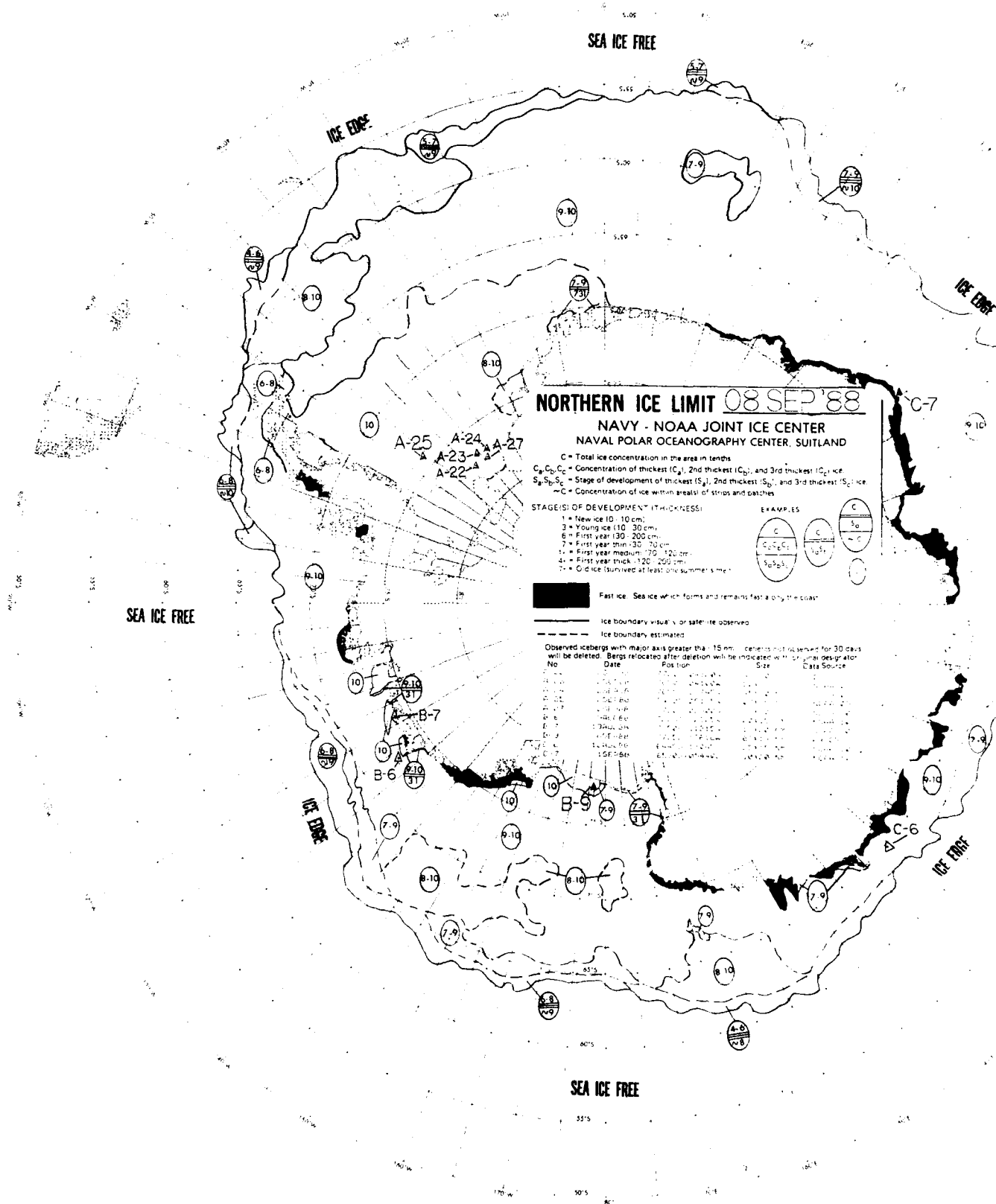
No.	Date	Position	Size	Date Source
1	27 JUL 88	71.10N 156.10W	1000m x 1000m	1000m
2	27 JUL 88	71.10N 156.10W	1000m x 1000m	1000m
3	27 JUL 88	71.10N 156.10W	1000m x 1000m	1000m
4	27 JUL 88	71.10N 156.10W	1000m x 1000m	1000m
5	27 JUL 88	71.10N 156.10W	1000m x 1000m	1000m
6	27 JUL 88	71.10N 156.10W	1000m x 1000m	1000m
7	27 JUL 88	71.10N 156.10W	1000m x 1000m	1000m
8	27 JUL 88	71.10N 156.10W	1000m x 1000m	1000m
9	27 JUL 88	71.10N 156.10W	1000m x 1000m	1000m
10	27 JUL 88	71.10N 156.10W	1000m x 1000m	1000m

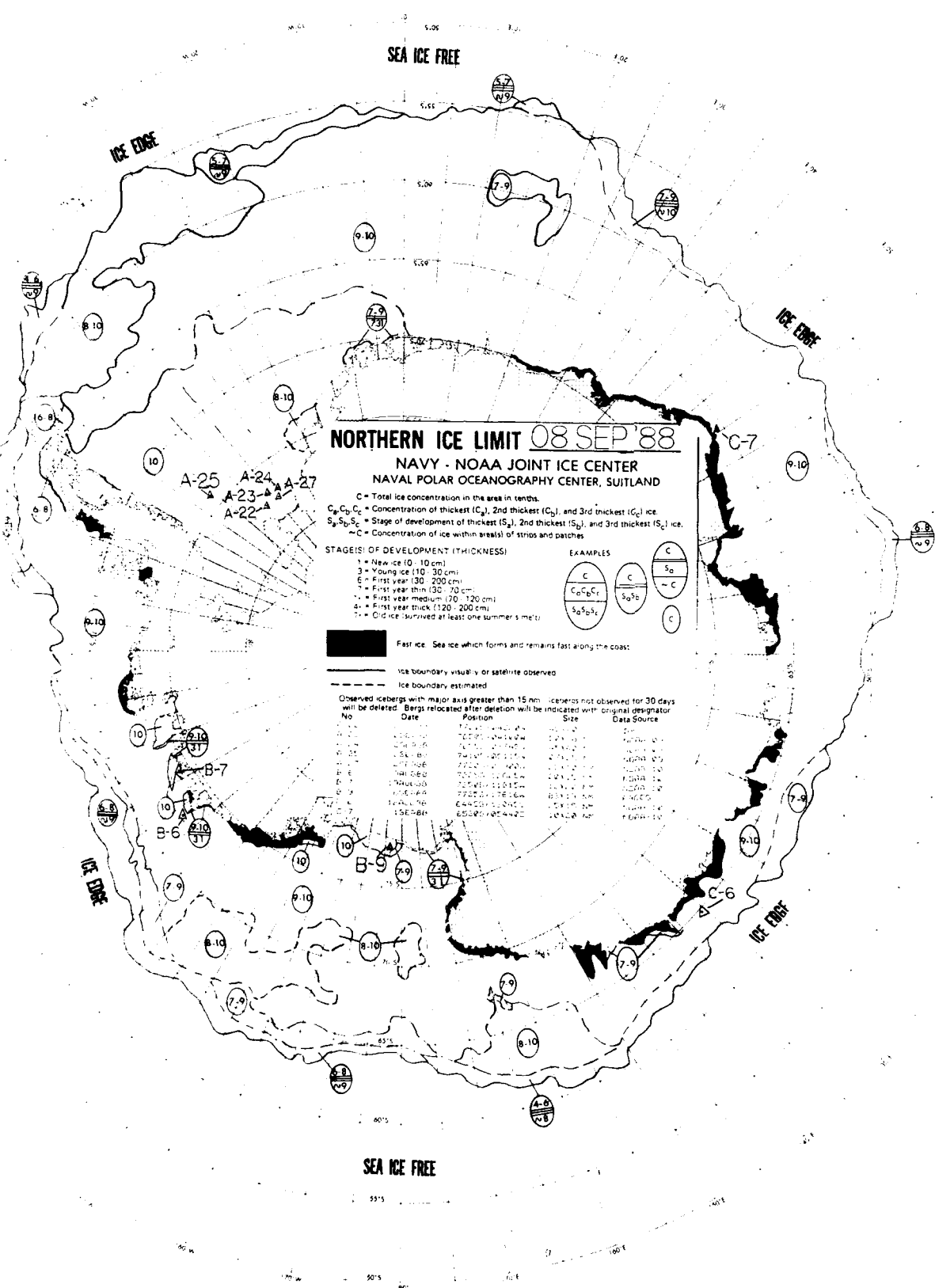
SEA ICE FREE

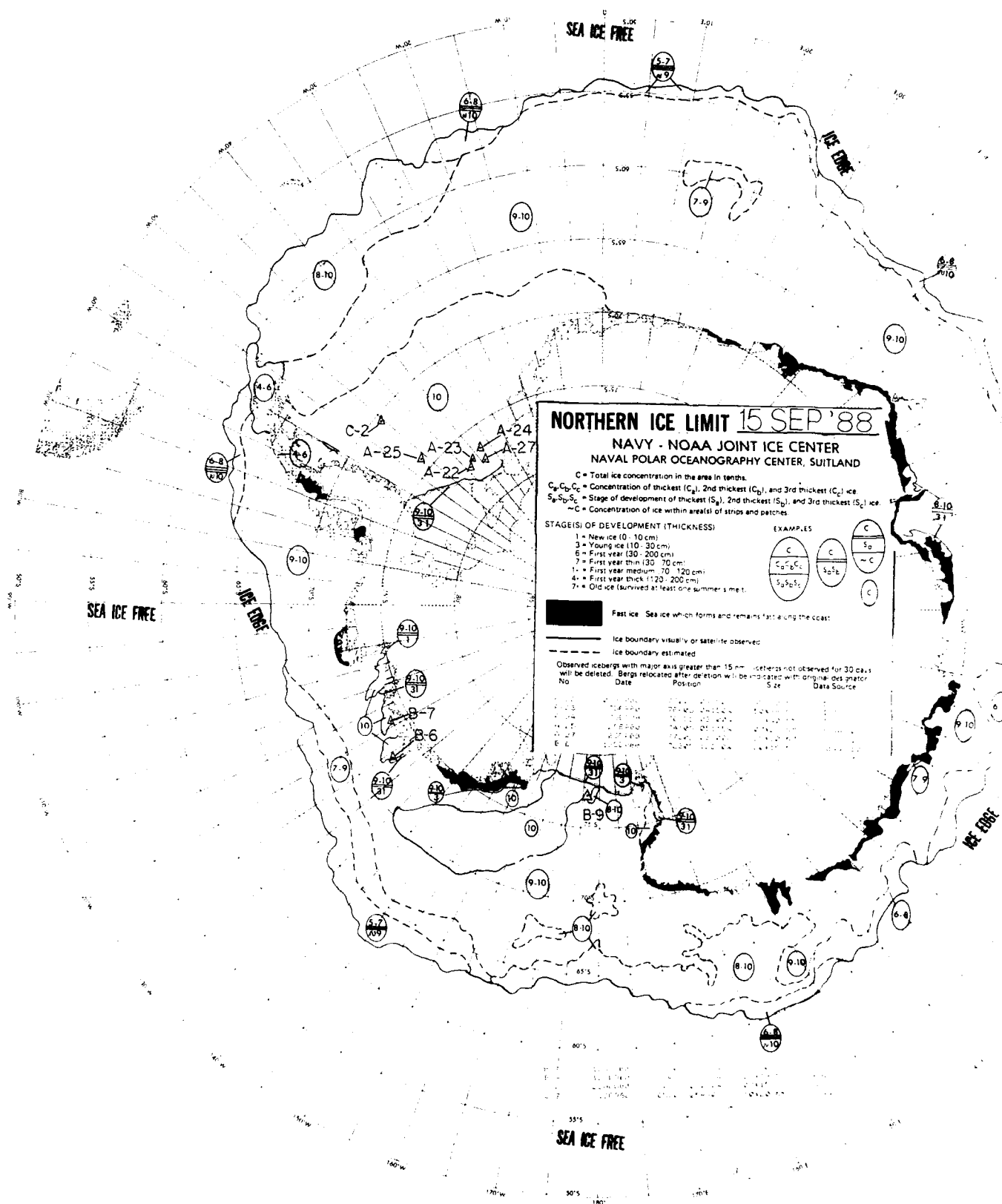




SEA ICE FREE







SEA ICE FREE

ICE EDGE

SEA ICE FREE

ICE EDGE

NORTHERN ICE LIMIT 15 SEP '88

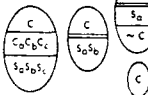
NAVY - NOAA JOINT ICE CENTER
NAVAL POLAR OCEANOGRAPHY CENTER, SUITLAND

C = Total ice concentration in the area in tenths.
C₁, C₂, C₃ = Concentration of thickest (C₁), 2nd thickest (C₂), and 3rd thickest (C₃) ice.
S₁, S₂, S₃ = Stage of development of thickest (S₁), 2nd thickest (S₂), and 3rd thickest (S₃) ice.
~C = Concentration of ice within area(s) of strips and patches.

STAGE(S) OF DEVELOPMENT (THICKNESS)

- 1 = New ice (10 - 10 cm)
- 2 = Young ice (10 - 30 cm)
- 3 = First year (30 - 200 cm)
- 4 = First year thin (30 - 70 cm)
- 5 = First year medium (70 - 120 cm)
- 6 = First year thick (120 - 200 cm)
- 7 = Old ice (survived at least one summer's melt)

EXAMPLES



Fast ice: Sea ice which forms and remains fast along the coast

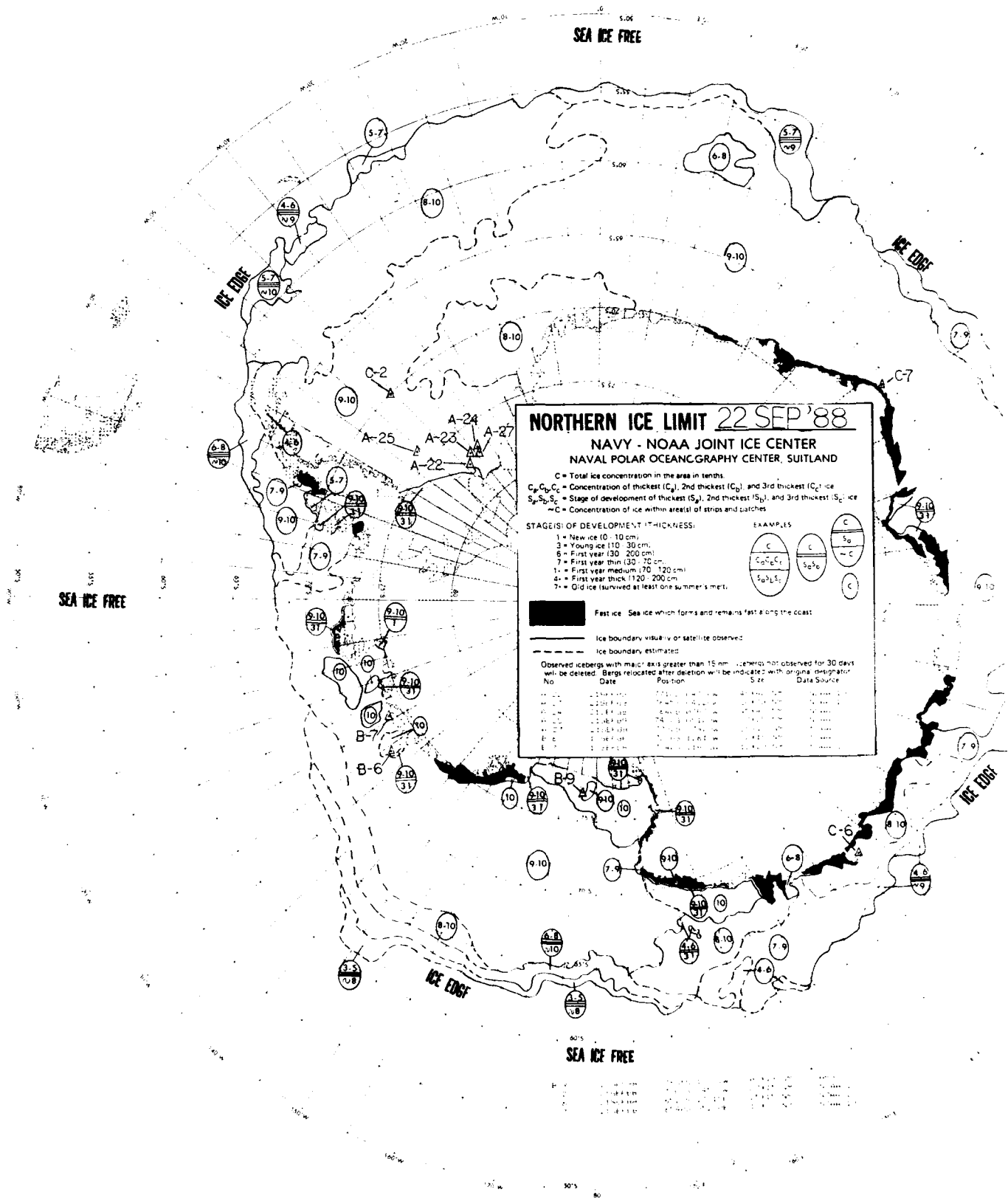
Ice boundary visually or satellite observed

Ice boundary estimated

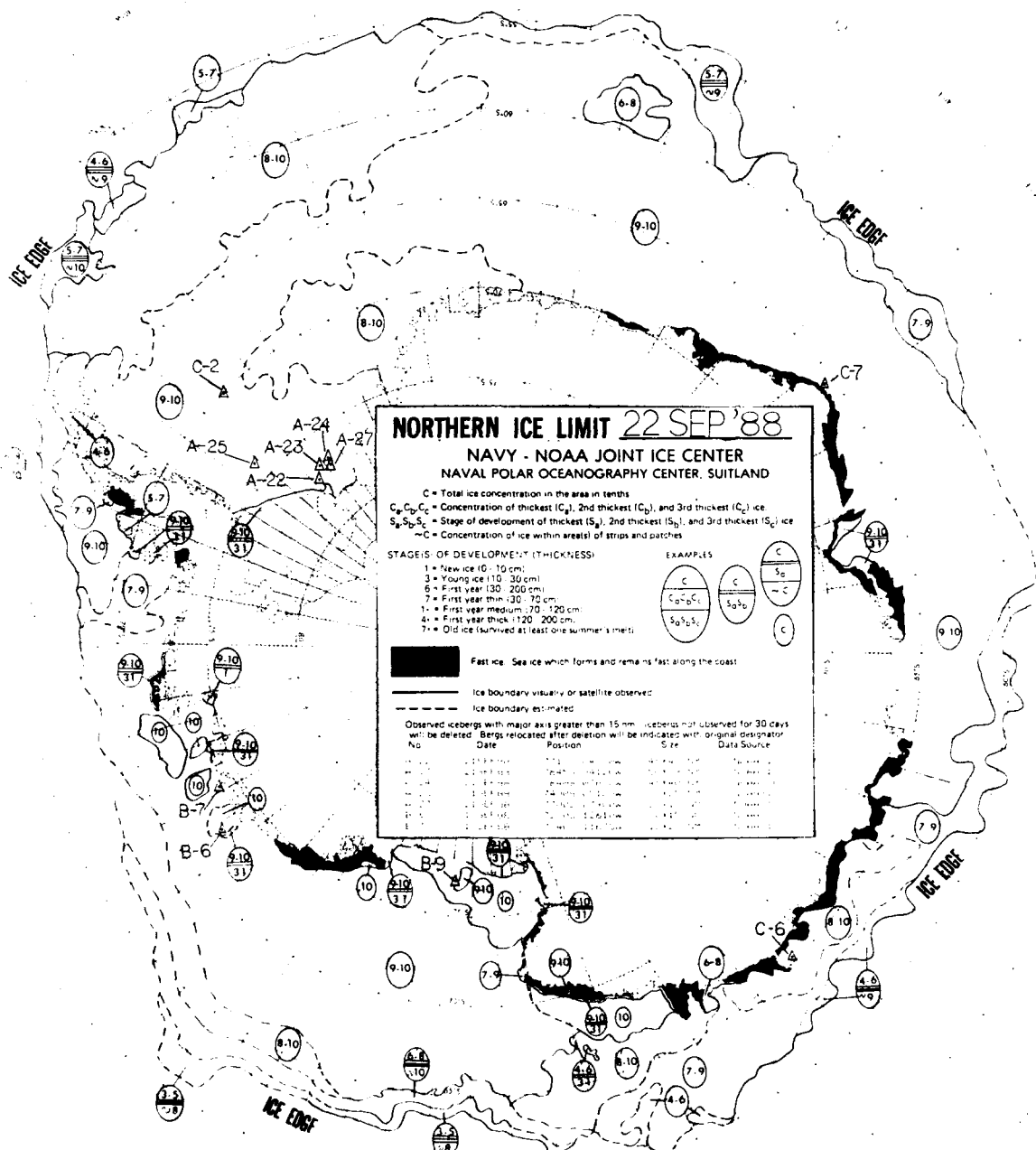
Observed icebergs with major axis greater than 15 nm. Icebergs not observed for 30 days will be deleted. Bergs relocated after deletion will be indicated with original designator.

No.	Date	Position	Size	Data Source
1	15 SEP 88	72°N 150°W	1000m x 2000m	NOAA
2	15 SEP 88	71°N 151°W	1200m x 2200m	NOAA
3	15 SEP 88	70°N 152°W	1100m x 2100m	NOAA
4	15 SEP 88	69°N 153°W	1300m x 2300m	NOAA
5	15 SEP 88	68°N 154°W	1400m x 2400m	NOAA
6	15 SEP 88	67°N 155°W	1500m x 2500m	NOAA
7	15 SEP 88	66°N 156°W	1600m x 2600m	NOAA
8	15 SEP 88	65°N 157°W	1700m x 2700m	NOAA
9	15 SEP 88	64°N 158°W	1800m x 2800m	NOAA
10	15 SEP 88	63°N 159°W	1900m x 2900m	NOAA

SEA ICE FREE

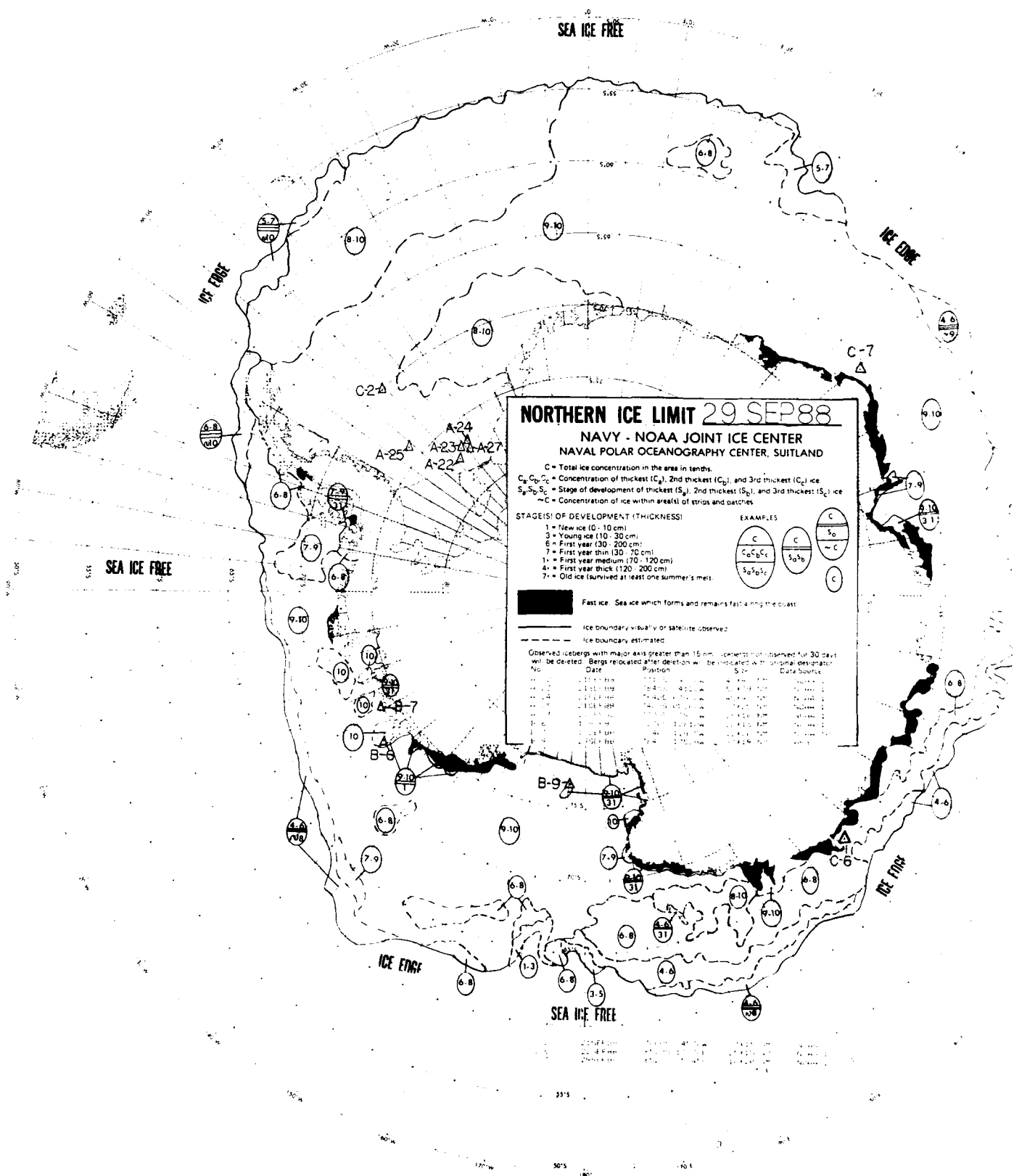


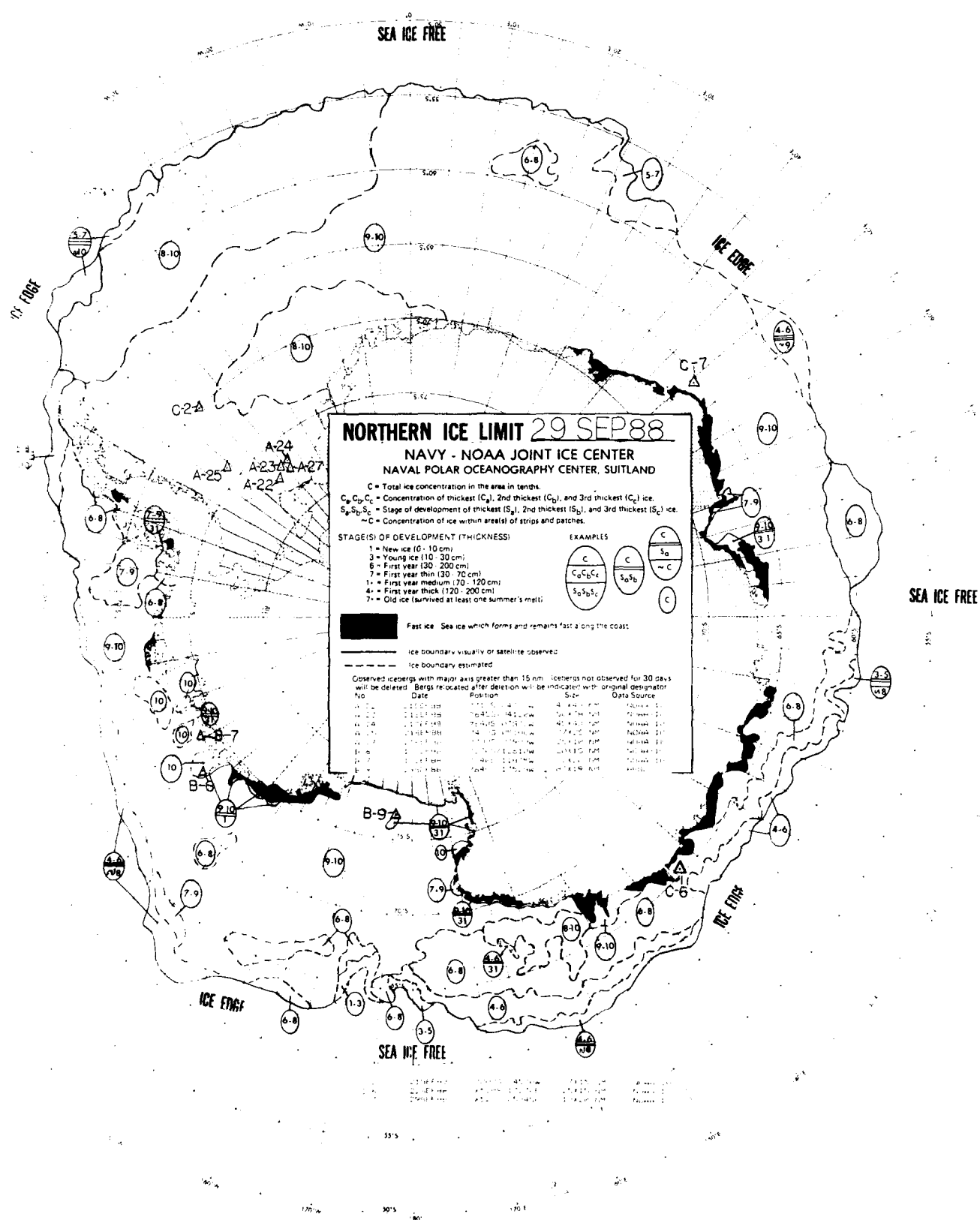
SEA ICE FREE

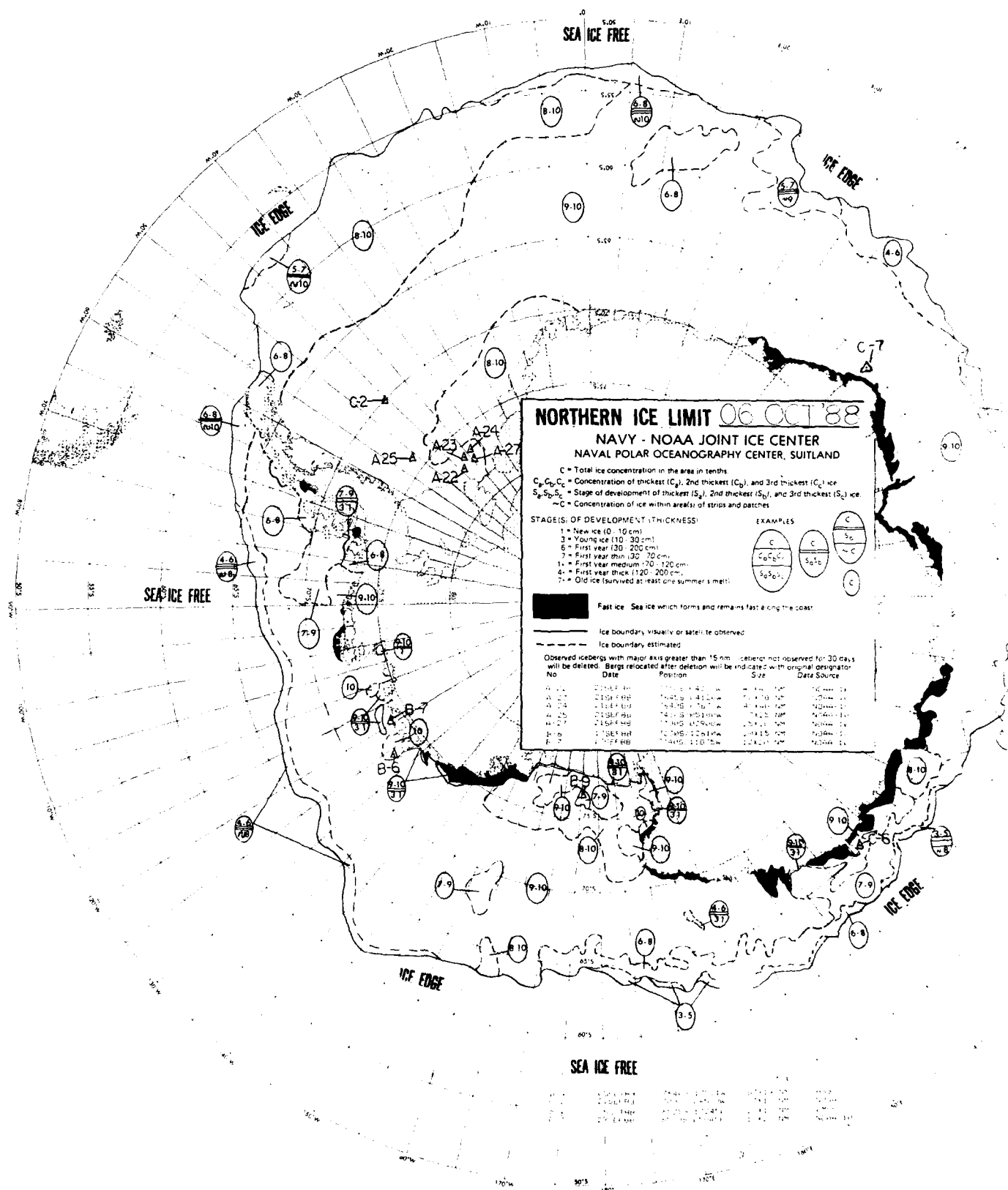


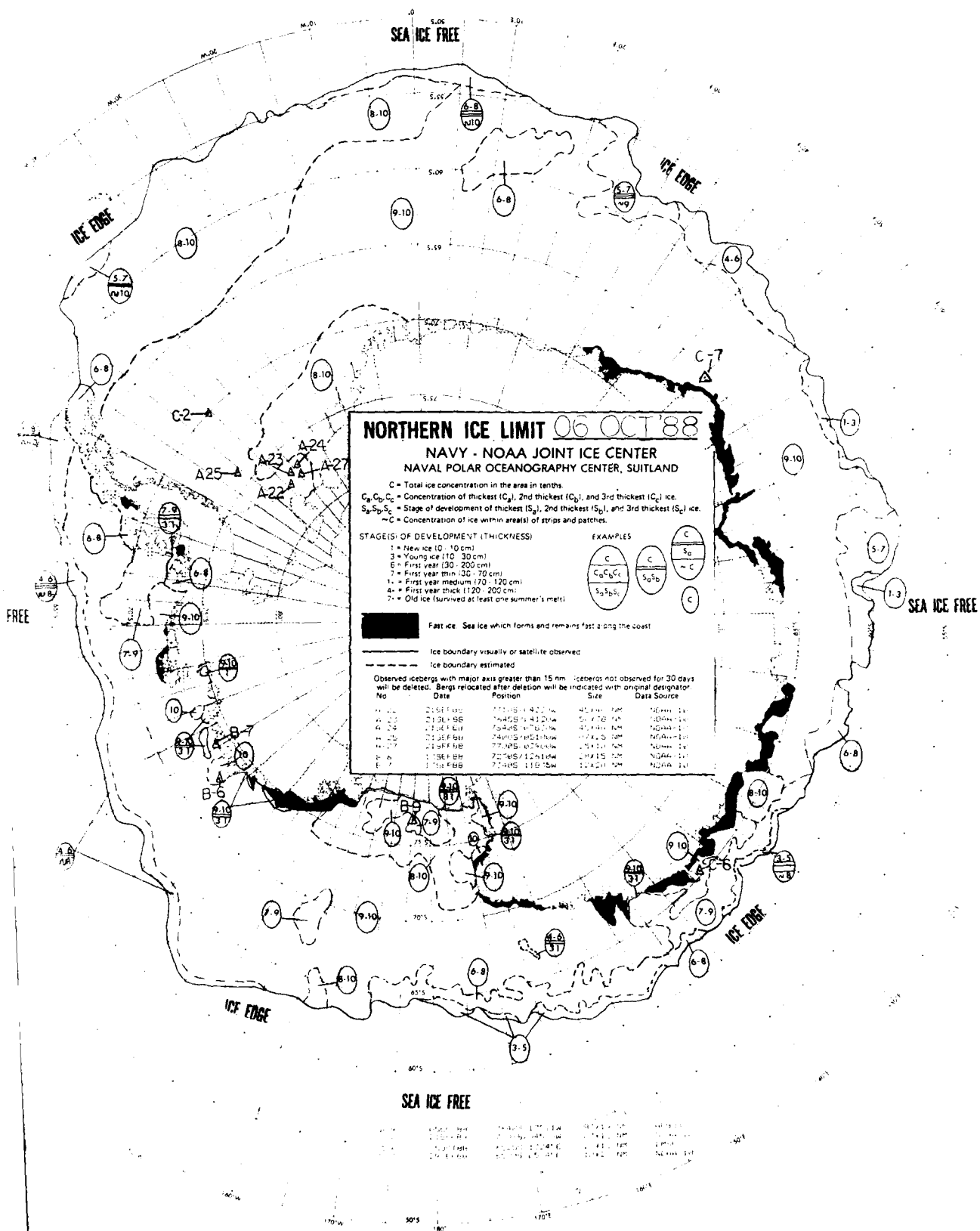
SEA ICE FREE

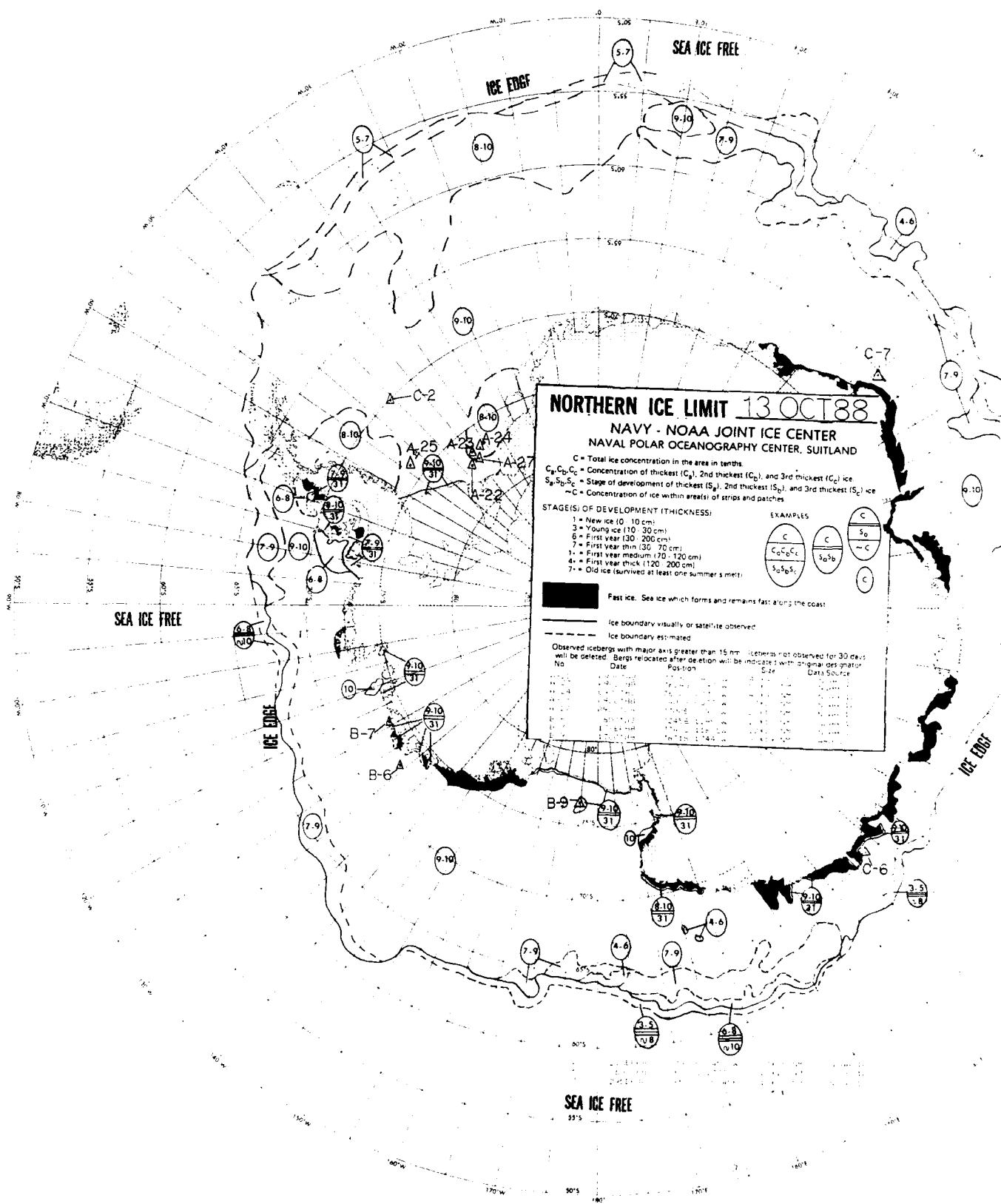
SEA ICE FREE

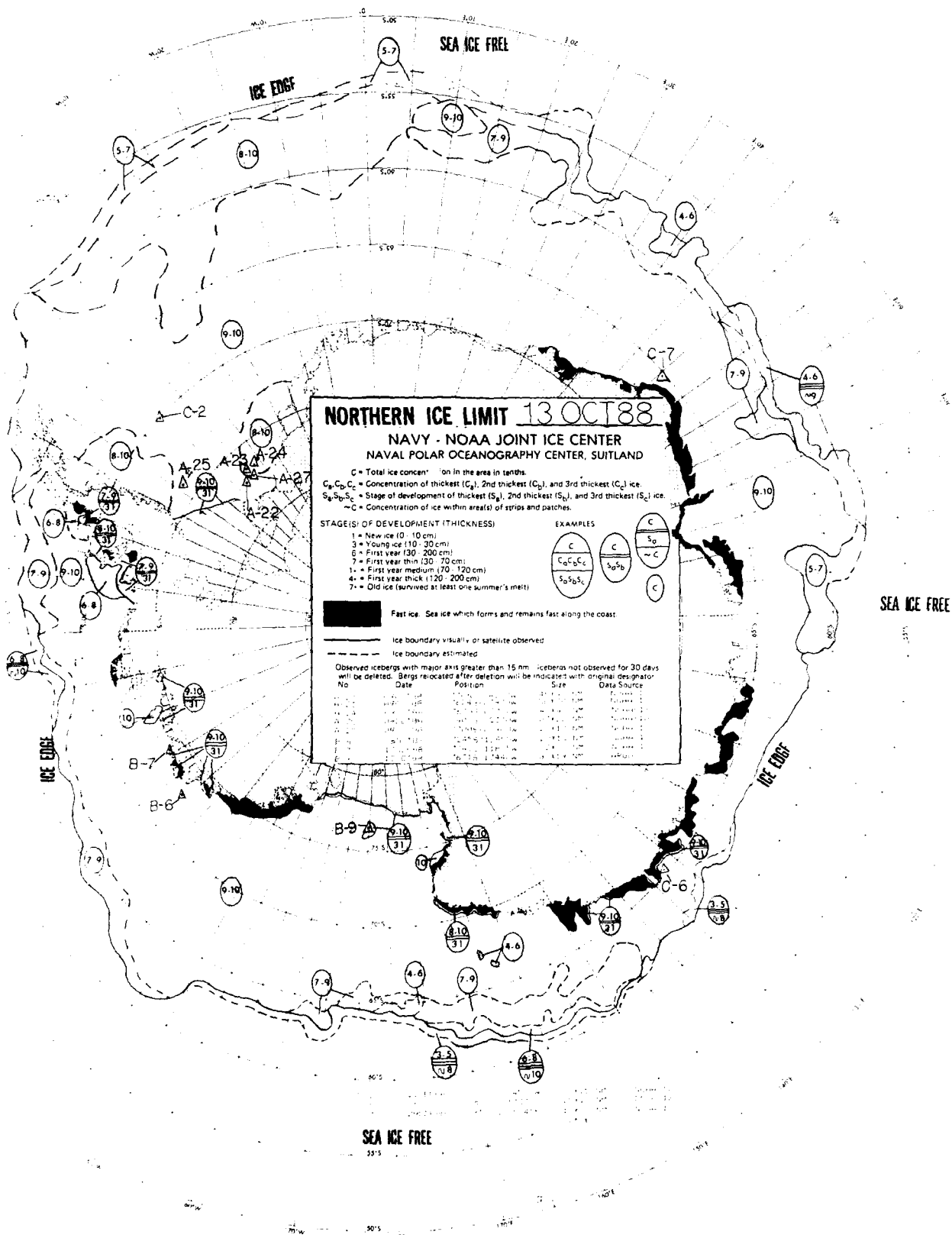


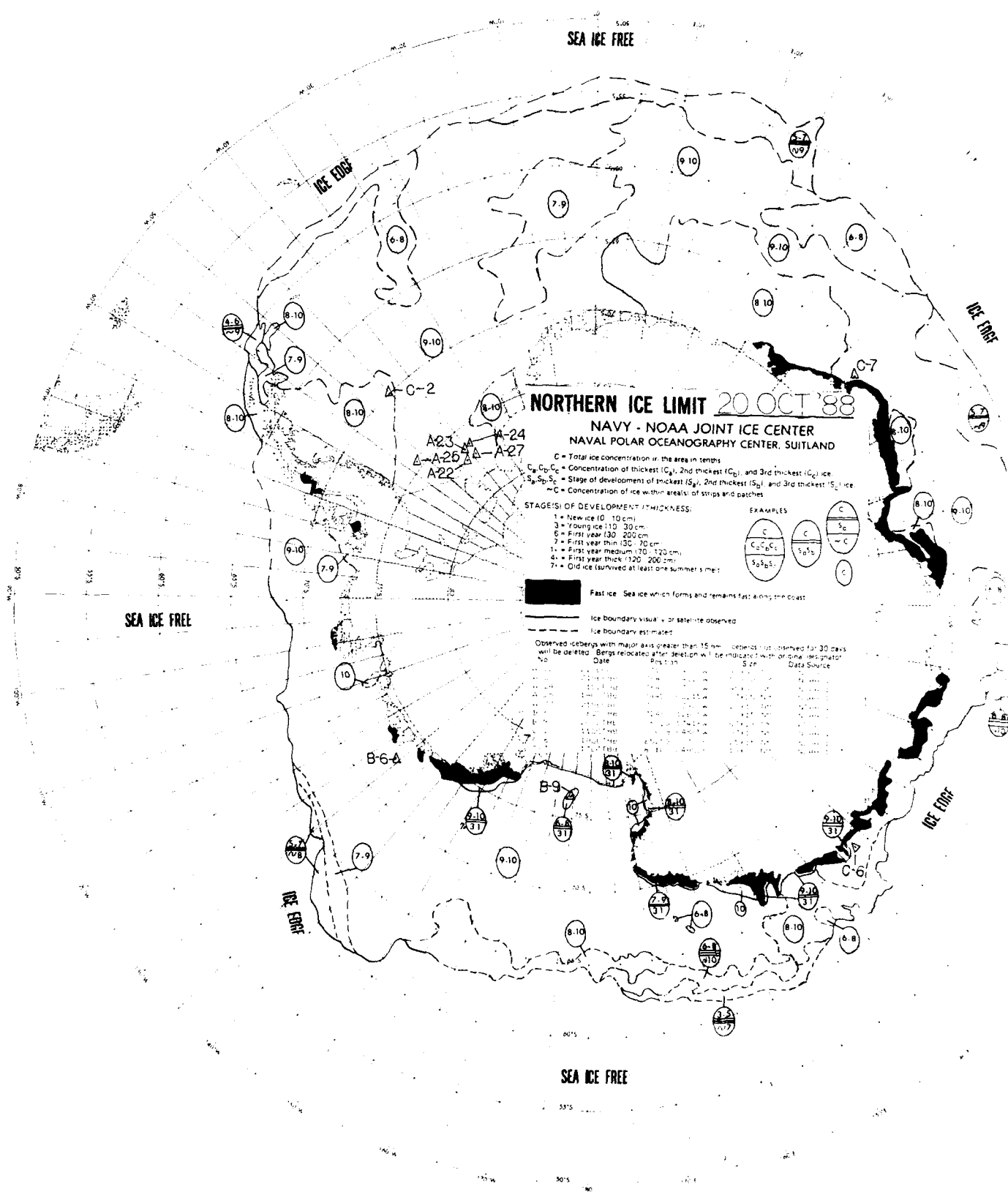












SEA ICE FREE

NORTHERN ICE LIMIT 20 OCT '88

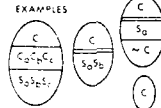
NAVY - NOAA JOINT ICE CENTER
NAVAL POLAR OCEANOGRAPHY CENTER, SUITLAND

C = Total ice concentration in the area in tenths
C₁ C₂ C₃ = Concentration of thickest (C₁), 2nd thickest (C₂), and 3rd thickest (C₃) ice
S₁ S₂ S₃ = Stage of development of thickest (S₁), 2nd thickest (S₂), and 3rd thickest (S₃) ice
~C = Concentration of ice within areas of strips and patches

STAGES OF DEVELOPMENT (THICKNESS)

- 1 = New ice 10 - 10 cm
- 2 = Young ice 110 - 30 cm
- 3 = First year thin 30 - 200 cm
- 4 = First year medium 70 - 120 cm
- 5 = First year thick 120 - 200 cm
- 6 = Old ice (survived at least one summer's melt)

EXAMPLES



Fast ice: Sea ice which forms and remains fast along the coast

Ice boundary: Visual or satellite observed

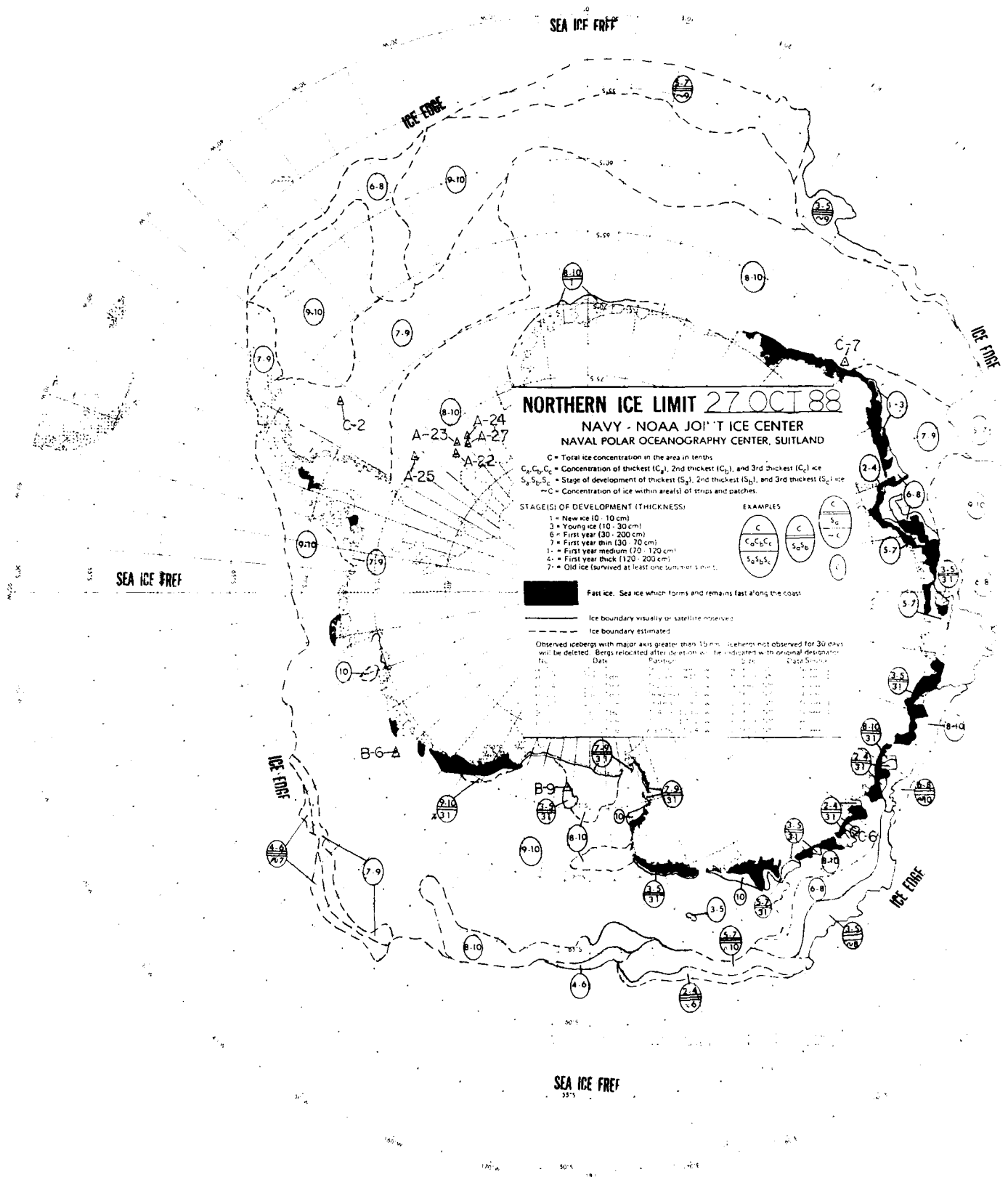
Ice boundary: Estimated

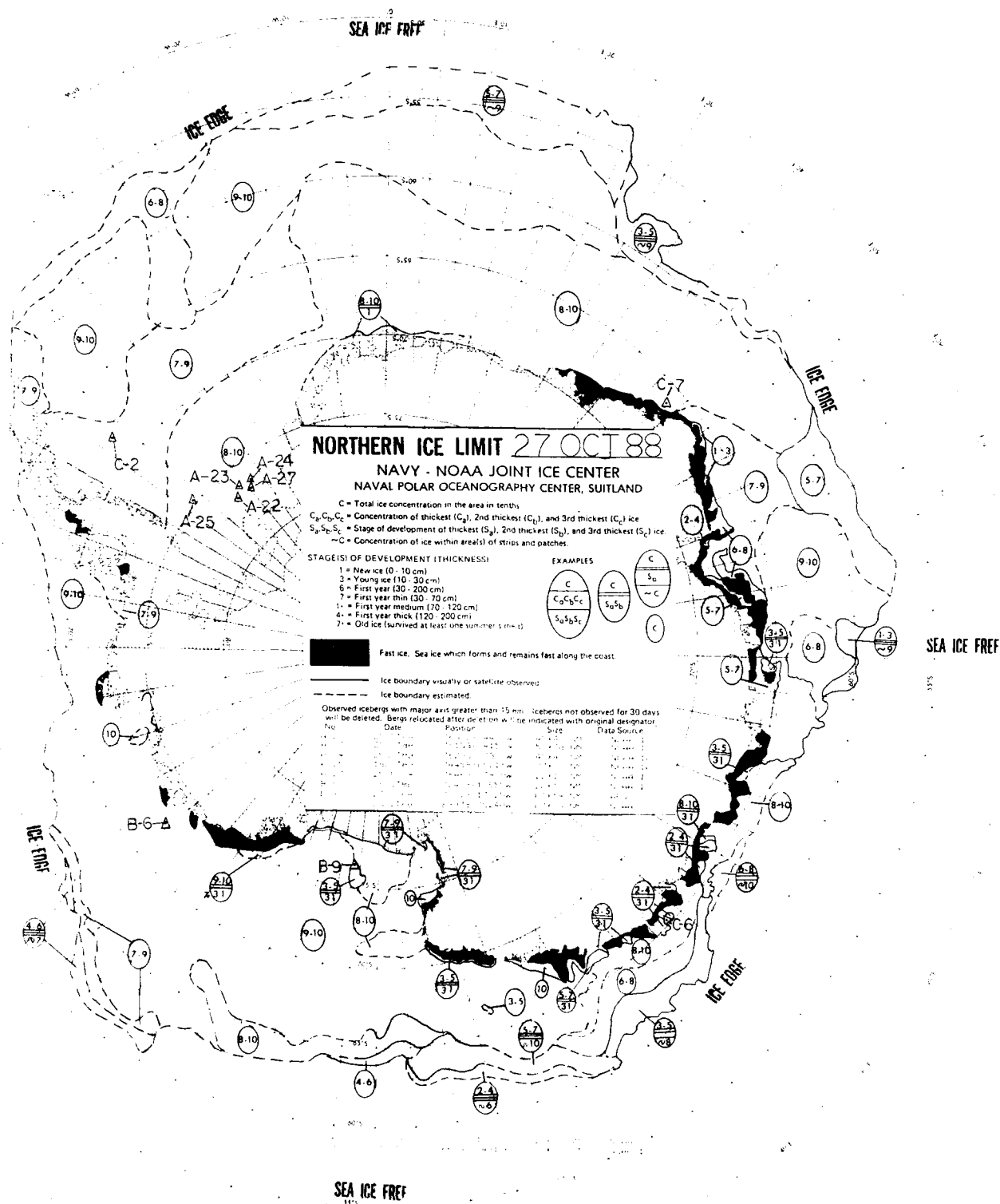
Observed icebergs with major axis greater than 5 m. Icebergs not observed for 30 days will be deleted. Bergs re-located after deletion will be indicated with original designator.

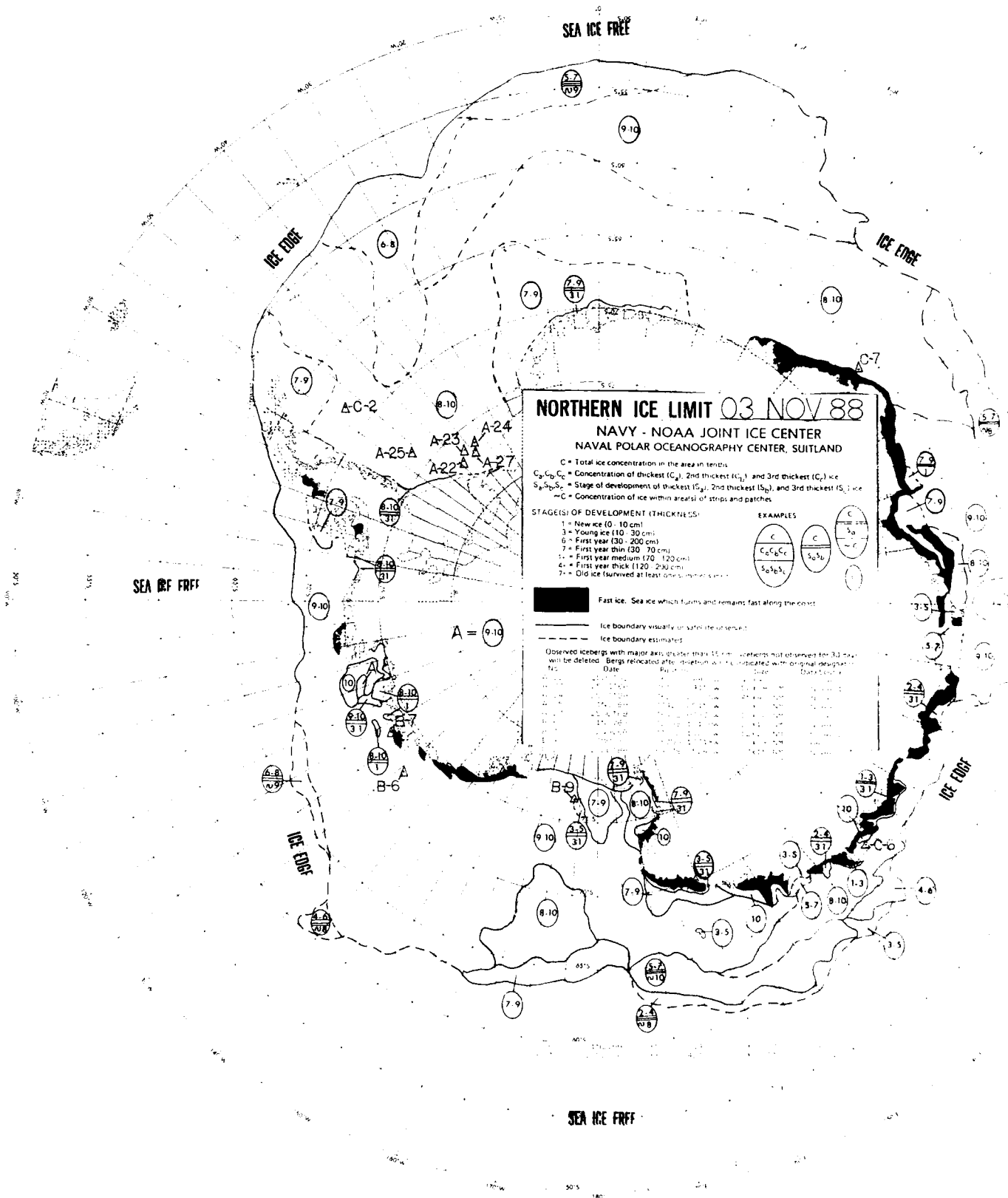
Date Post 177 Date Source

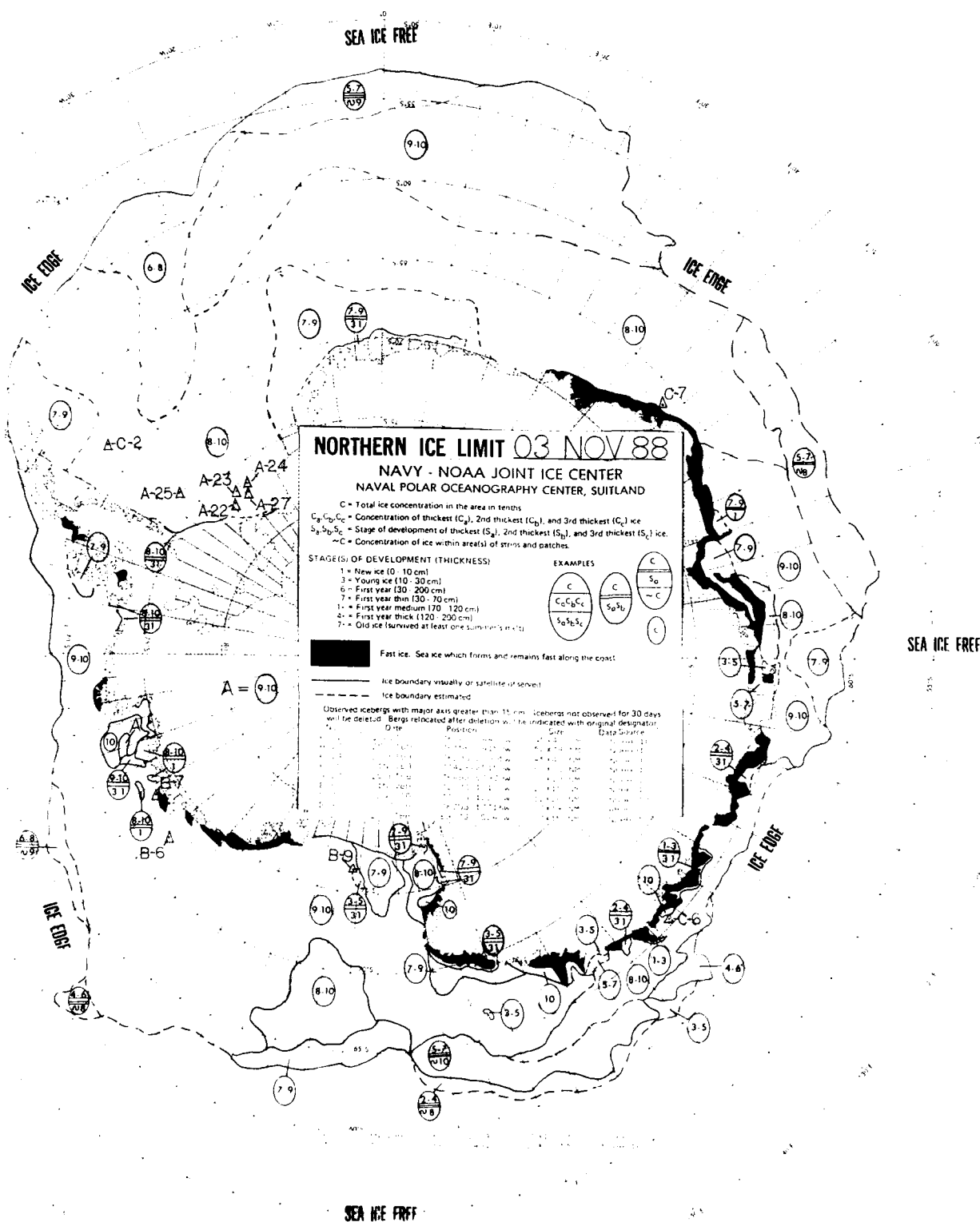
SEA ICE FREE

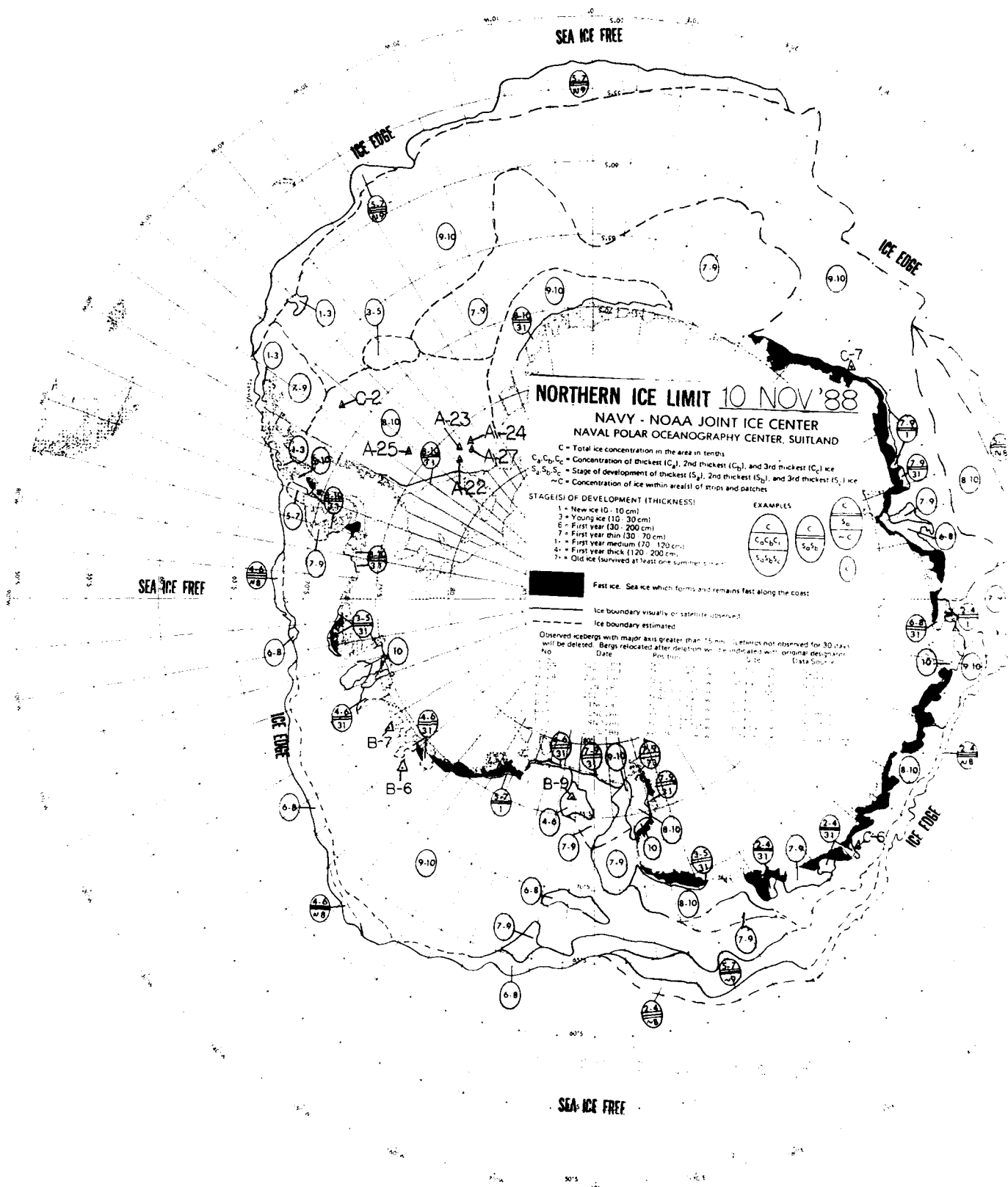
SEA ICE FREE











SEA ICE FREE

ICE EDGE

ICE EDGE

NORTHERN ICE LIMIT 10 NOV '88

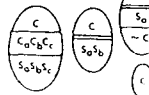
NAVY - NOAA JOINT ICE CENTER
NAVAL POLAR OCEANOGRAPHY CENTER, SUITLAND

C = Total ice concentration in the area in tenths
C₁, C₂, C₃ = Concentration of thickest (C₁), 2nd thickest (C₂), and 3rd thickest (C₃) ice
S₁, S₂, S₃ = Stage of development of thickest (S₁), 2nd thickest (S₂), and 3rd thickest (S₃) ice
C₁S₁, C₂S₂, C₃S₃ = Concentration of ice within areas (S₁, S₂, S₃) of strips and patches

STAGES OF DEVELOPMENT (THICKNESS)

- 1 = New ice (0 - 10 cm)
- 2 = Young ice (10 - 30 cm)
- 3 = First year (30 - 200 cm)
- 4 = First year thin (30 - 70 cm)
- 5 = First year medium (70 - 120 cm)
- 6 = First year thick (120 - 200 cm)
- 7 = Old ice (survived at least one summer's melt)

EXAMPLES



Fast ice: Sea ice which forms and remains fast along the coast.

Ice boundary visually or satellite observed

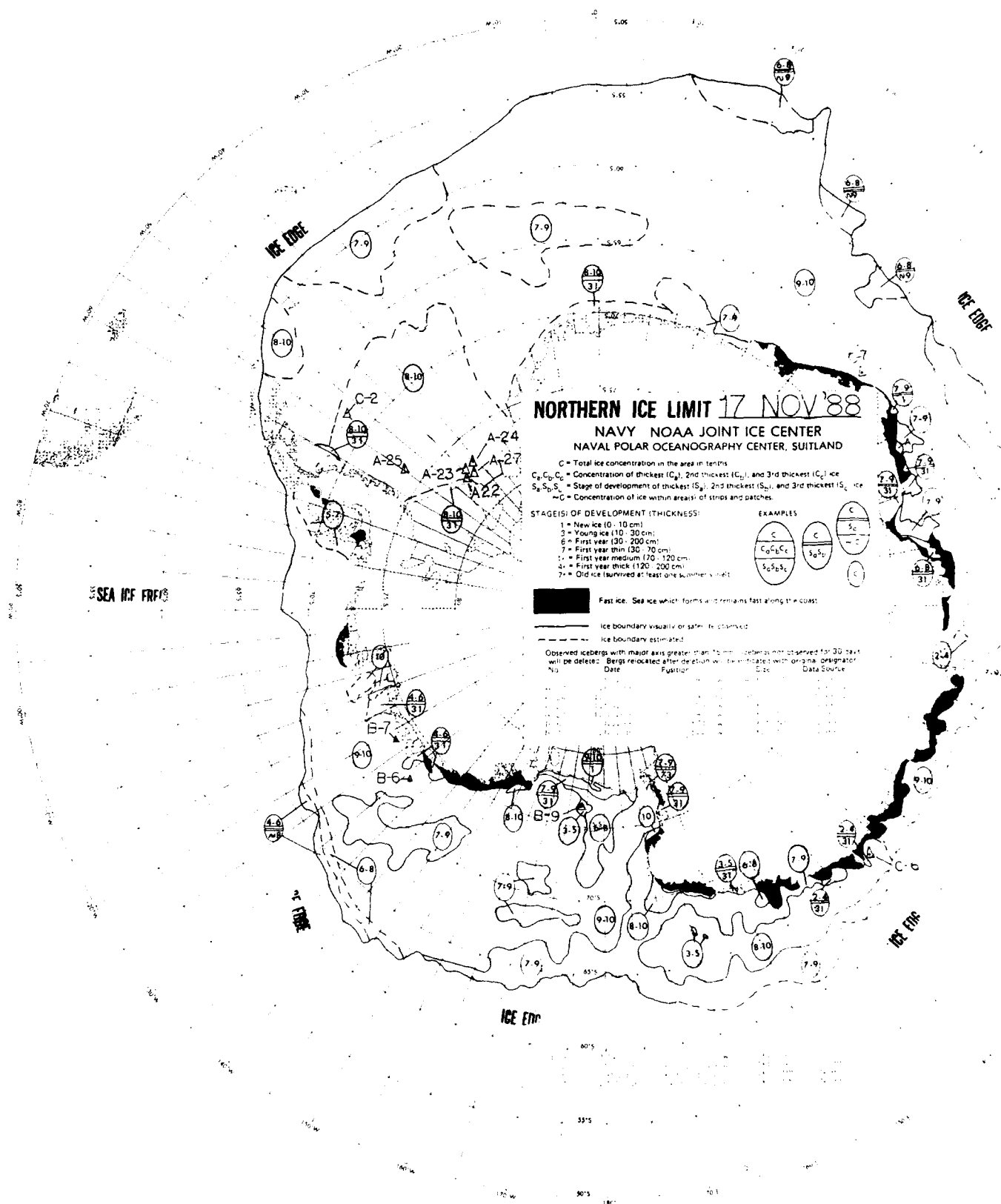
Ice boundary estimated

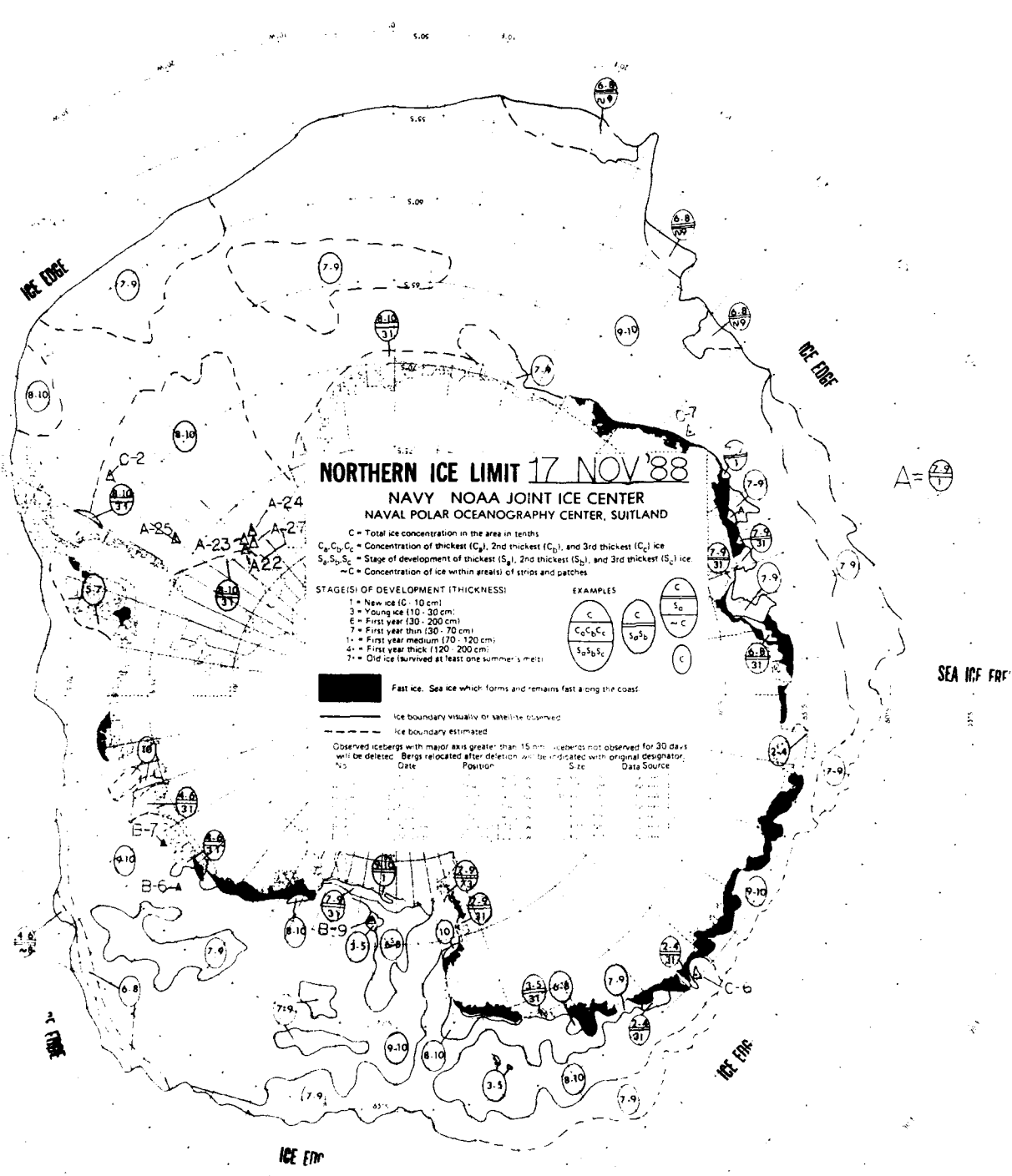
Observed icebergs with major axis greater than 15 nm. Icebergs not observed for 30 days will be deleted. Berge relocated after deletion will be indicated with original designator.

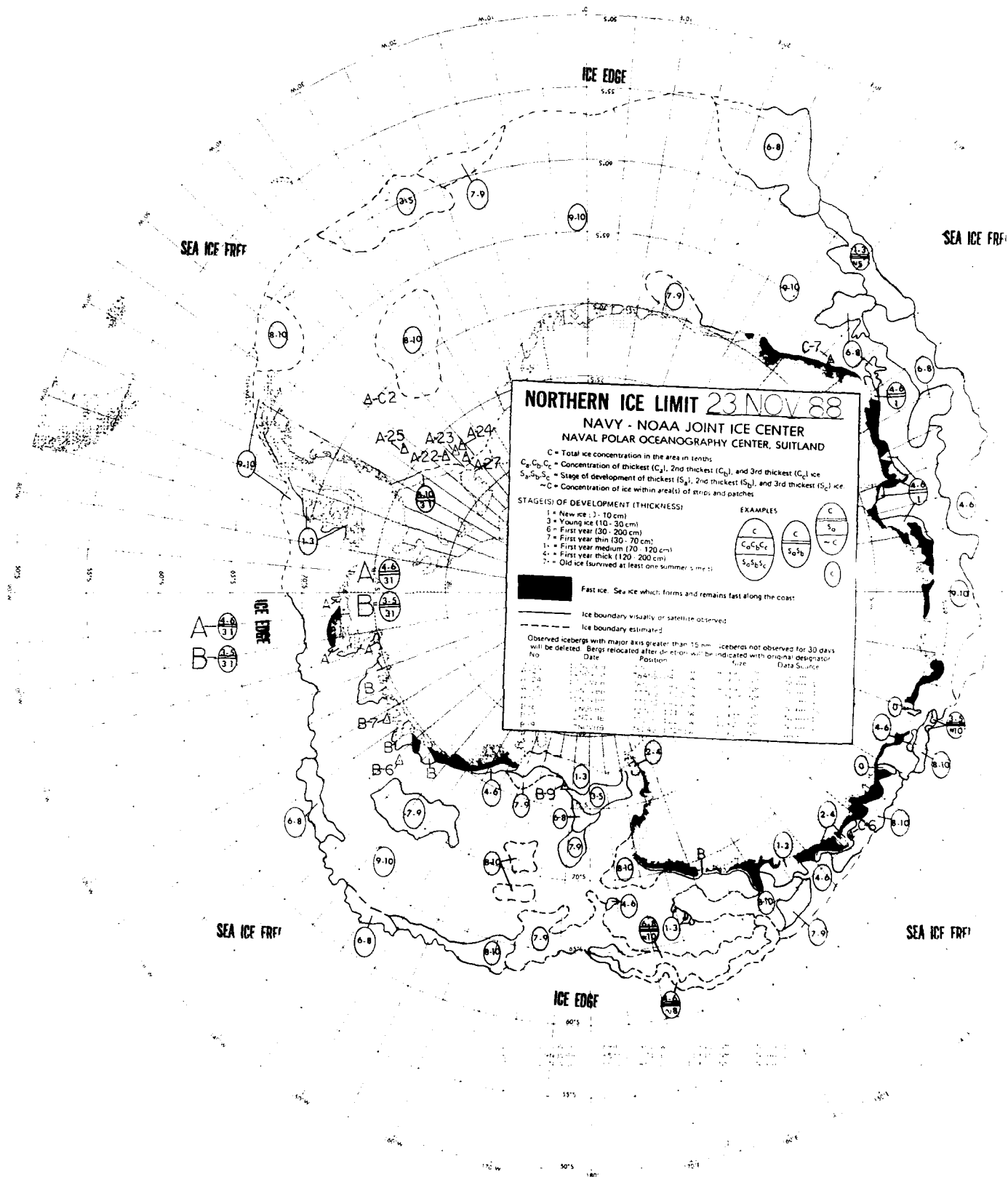
Date Position Size Data Source

SEA ICE FREE

SEA ICE FREE







ICE EDGE

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ICE FRFT

NORTHERN ICE LIMIT 23 NOV 88

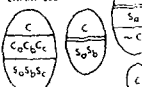
NAVY - NOAA JOINT ICE CENTER
NAVAL POLAR OCEANOGRAPHY CENTER, SUITLAND

C = Total ice concentration in the area in tenths
C₁, C₂, C₃ = Concentration of thickest (C₁), 2nd thickest (C₂), and 3rd thickest (C₃) ice
S₁, S₂, S₃ = Stage of development of thickest (S₁), 2nd thickest (S₂), and 3rd thickest (S₃) ice
→ C = Concentration of ice within areas of strips and patches

STAGE(S) OF DEVELOPMENT (THICKNESS)

- 1 = New ice (0 - 10 cm)
- 3 = Young ice (10 - 30 cm)
- 6 = First year (30 - 200 cm)
- 7 = First year thin (30 - 70 cm)
- 1 = First year medium (70 - 120 cm)
- 4 = First year thick (120 - 200 cm)
- 7 = Old ice (survived at least one summer's melt)

EXAMPLES



Fast ice: Sea ice which forms and remains fast along the coast.

Ice boundary visually or satellite observed

Ice boundary estimated

Observed icebergs with major axis greater than 15 nm. Icebergs not observed for 30 days will be deleted. Bergs relocated after deletion will be indicated with original designator.

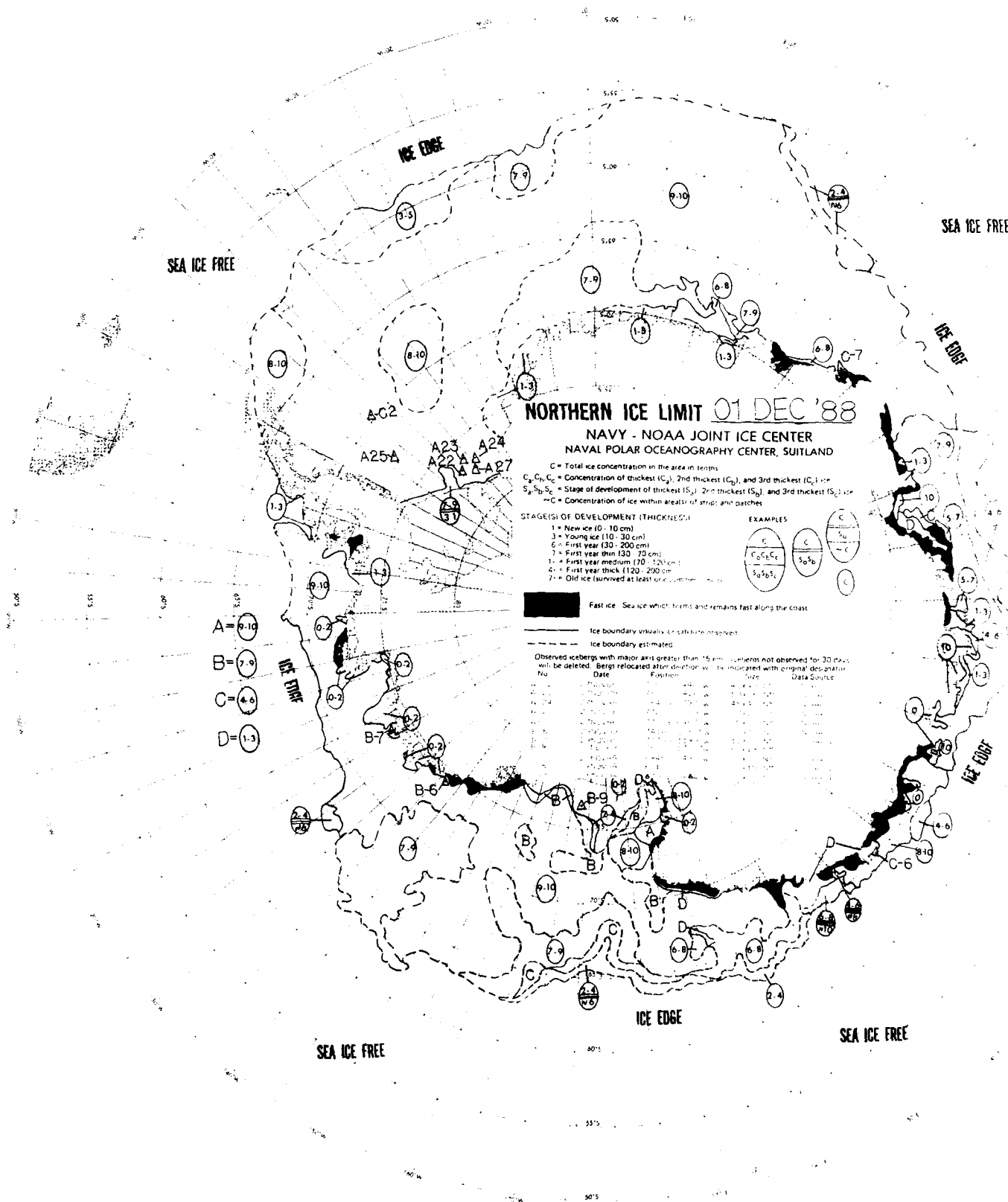
No.	Date	Position	Size	Data Source
1	11/11/88	72°N 15°E	100 x 100	NAO
2	11/11/88	72°N 15°E	100 x 100	NAO
3	11/11/88	72°N 15°E	100 x 100	NAO
4	11/11/88	72°N 15°E	100 x 100	NAO
5	11/11/88	72°N 15°E	100 x 100	NAO
6	11/11/88	72°N 15°E	100 x 100	NAO
7	11/11/88	72°N 15°E	100 x 100	NAO
8	11/11/88	72°N 15°E	100 x 100	NAO
9	11/11/88	72°N 15°E	100 x 100	NAO
10	11/11/88	72°N 15°E	100 x 100	NAO

ICE EDGE

SEA ICE FRFT

SEA ICE FRFT

ICE EDGE



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SEA ICE FREE

SEA ICE FREE

SEA ICE FREE

NORTHERN ICE LIMIT 01 DEC '88

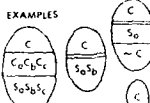
NAVY - NOAA JOINT ICE CENTER
NAVAL POLAR OCEANOGRAPHY CENTER, SUITLAND

C = Total ice concentration in the area in tenths
C₁C₂C₃ = Concentration of thickest (C₁), 2nd thickest (C₂), and 3rd thickest (C₃) ice
S₁S₂S₃ = Stage of development of thickest (S₁), 2nd thickest (S₂), and 3rd thickest (S₃) ice
C = Concentration of ice within area(s) of strips and patches

STAGES OF DEVELOPMENT (THICKNESS)

- 1 = New ice (0 - 10 cm)
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- 3 = First year (30 - 200 cm)
- 4 = First year thin (30 - 70 cm)
- 5 = First year medium (70 - 120 cm)
- 6 = First year thick (120 - 200 cm)
- 7 = Old ice (survived at least one summer season)

EXAMPLES

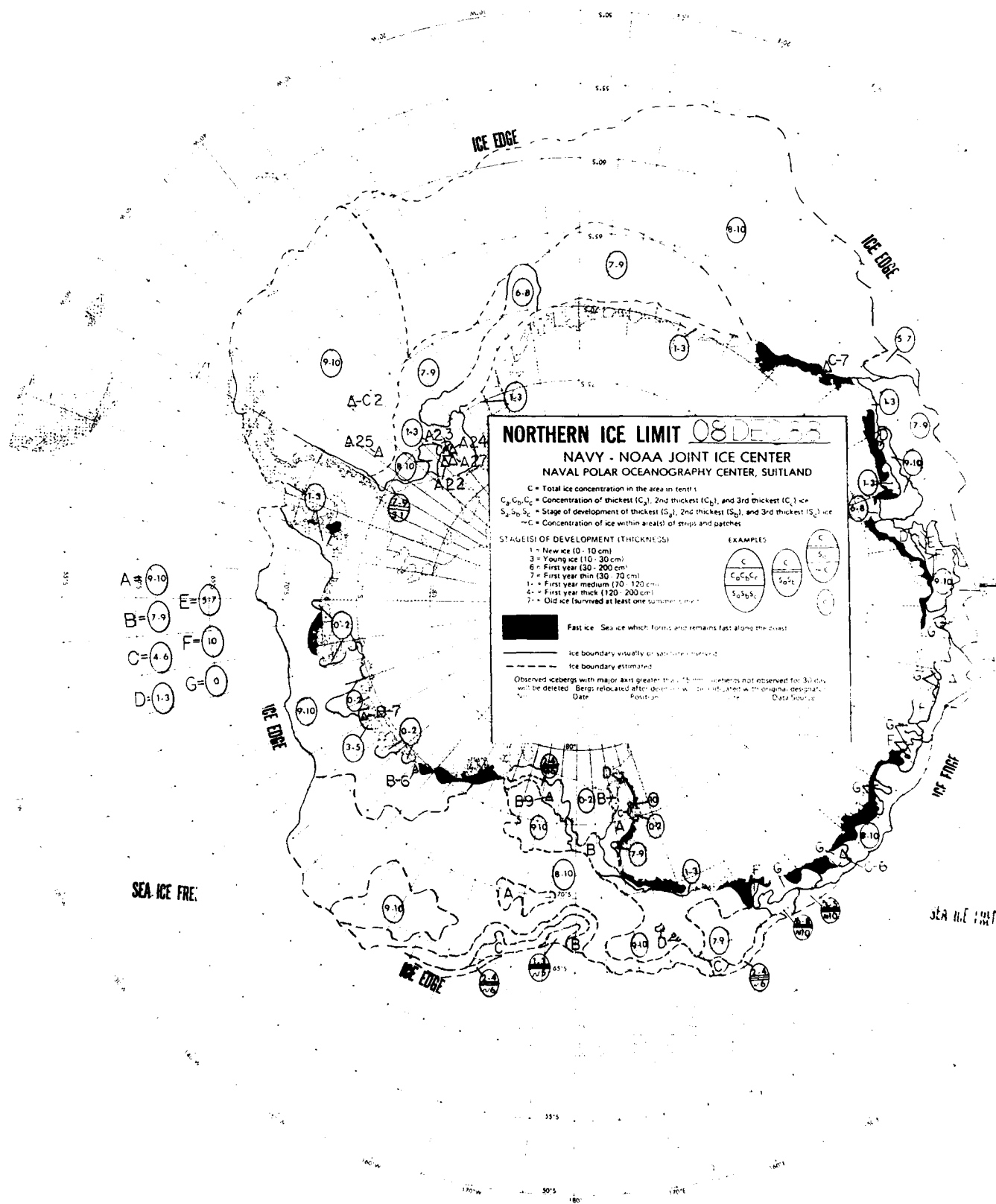


Fast ice: Sea ice which forms and remains fast along the coast

Ice boundary visually or satellite observed
Ice boundary estimated

Observed icebergs with major axis greater than 15 nm. Icebergs not observed for 30 days will be deleted. Bergs relocated after deletion will be indicated with original designator.

No.	Date	Position	Size	Data Source
1	12/1/88	75°N 150°W	100 x 200 m	NOAA
2	12/1/88	75°N 150°W	100 x 200 m	NOAA
3	12/1/88	75°N 150°W	100 x 200 m	NOAA
4	12/1/88	75°N 150°W	100 x 200 m	NOAA
5	12/1/88	75°N 150°W	100 x 200 m	NOAA
6	12/1/88	75°N 150°W	100 x 200 m	NOAA
7	12/1/88	75°N 150°W	100 x 200 m	NOAA
8	12/1/88	75°N 150°W	100 x 200 m	NOAA
9	12/1/88	75°N 150°W	100 x 200 m	NOAA
10	12/1/88	75°N 150°W	100 x 200 m	NOAA
11	12/1/88	75°N 150°W	100 x 200 m	NOAA
12	12/1/88	75°N 150°W	100 x 200 m	NOAA
13	12/1/88	75°N 150°W	100 x 200 m	NOAA
14	12/1/88	75°N 150°W	100 x 200 m	NOAA
15	12/1/88	75°N 150°W	100 x 200 m	NOAA
16	12/1/88	75°N 150°W	100 x 200 m	NOAA
17	12/1/88	75°N 150°W	100 x 200 m	NOAA
18	12/1/88	75°N 150°W	100 x 200 m	NOAA
19	12/1/88	75°N 150°W	100 x 200 m	NOAA
20	12/1/88	75°N 150°W	100 x 200 m	NOAA
21	12/1/88	75°N 150°W	100 x 200 m	NOAA
22	12/1/88	75°N 150°W	100 x 200 m	NOAA
23	12/1/88	75°N 150°W	100 x 200 m	NOAA
24	12/1/88	75°N 150°W	100 x 200 m	NOAA
25	12/1/88	75°N 150°W	100 x 200 m	NOAA
26	12/1/88	75°N 150°W	100 x 200 m	NOAA
27	12/1/88	75°N 150°W	100 x 200 m	NOAA
28	12/1/88	75°N 150°W	100 x 200 m	NOAA
29	12/1/88	75°N 150°W	100 x 200 m	NOAA
30	12/1/88	75°N 150°W	100 x 200 m	NOAA
31	12/1/88	75°N 150°W	100 x 200 m	NOAA
32	12/1/88	75°N 150°W	100 x 200 m	NOAA
33	12/1/88	75°N 150°W	100 x 200 m	NOAA
34	12/1/88	75°N 150°W	100 x 200 m	NOAA
35	12/1/88	75°N 150°W	100 x 200 m	NOAA
36	12/1/88	75°N 150°W	100 x 200 m	NOAA
37	12/1/88	75°N 150°W	100 x 200 m	NOAA
38	12/1/88	75°N 150°W	100 x 200 m	NOAA
39	12/1/88	75°N 150°W	100 x 200 m	NOAA
40	12/1/88	75°N 150°W	100 x 200 m	NOAA
41	12/1/88	75°N 150°W	100 x 200 m	NOAA
42	12/1/88	75°N 150°W	100 x 200 m	NOAA
43	12/1/88	75°N 150°W	100 x 200 m	NOAA
44	12/1/88	75°N 150°W	100 x 200 m	NOAA
45	12/1/88	75°N 150°W	100 x 200 m	NOAA
46	12/1/88	75°N 150°W	100 x 200 m	NOAA
47	12/1/88	75°N 150°W	100 x 200 m	NOAA
48	12/1/88	75°N 150°W	100 x 200 m	NOAA
49	12/1/88	75°N 150°W	100 x 200 m	NOAA
50	12/1/88	75°N 150°W	100 x 200 m	NOAA
51	12/1/88	75°N 150°W	100 x 200 m	NOAA
52	12/1/88	75°N 150°W	100 x 200 m	NOAA
53	12/1/88	75°N 150°W	100 x 200 m	NOAA
54	12/1/88	75°N 150°W	100 x 200 m	NOAA
55	12/1/88	75°N 150°W	100 x 200 m	NOAA
56	12/1/88	75°N 150°W	100 x 200 m	NOAA
57	12/1/88	75°N 150°W	100 x 200 m	NOAA
58	12/1/88	75°N 150°W	100 x 200 m	NOAA
59	12/1/88	75°N 150°W	100 x 200 m	NOAA
60	12/1/88	75°N 150°W	100 x 200 m	NOAA
61	12/1/88	75°N 150°W	100 x 200 m	NOAA
62	12/1/88	75°N 150°W	100 x 200 m	NOAA
63	12/1/88	75°N 150°W	100 x 200 m	NOAA
64	12/1/88	75°N 150°W	100 x 200 m	NOAA
65	12/1/88	75°N 150°W	100 x 200 m	NOAA
66	12/1/88	75°N 150°W	100 x 200 m	NOAA
67	12/1/88	75°N 150°W	100 x 200 m	NOAA
68	12/1/88	75°N 150°W	100 x 200 m	NOAA
69	12/1/88	75°N 150°W	100 x 200 m	NOAA
70	12/1/88	75°N 150°W	100 x 200 m	NOAA
71	12/1/88	75°N 150°W	100 x 200 m	NOAA
72	12/1/88	75°N 150°W	100 x 200 m	NOAA
73	12/1/88	75°N 150°W	100 x 200 m	NOAA
74	12/1/88	75°N 150°W	100 x 200 m	NOAA
75	12/1/88	75°N 150°W	100 x 200 m	NOAA
76	12/1/88	75°N 150°W	100 x 200 m	NOAA
77	12/1/88	75°N 150°W	100 x 200 m	NOAA
78	12/1/88	75°N 150°W	100 x 200 m	NOAA
79	12/1/88	75°N 150°W	100 x 200 m	NOAA
80	12/1/88	75°N 150°W	100 x 200 m	NOAA
81	12/1/88	75°N 150°W	100 x 200 m	NOAA
82	12/1/88	75°N 150°W	100 x 200 m	NOAA
83	12/1/88	75°N 150°W	100 x 200 m	NOAA
84	12/1/88	75°N 150°W	100 x 200 m	NOAA
85	12/1/88	75°N 150°W	100 x 200 m	NOAA
86	12/1/88	75°N 150°W	100 x 200 m	NOAA
87	12/1/88	75°N 150°W	100 x 200 m	NOAA
88	12/1/88	75°N 150°W	100 x 200 m	NOAA
89	12/1/88	75°N 150°W	100 x 200 m	NOAA
90	12/1/88	75°N 150°W	100 x 200 m	NOAA
91	12/1/88	75°N 150°W	100 x 200 m	NOAA
92	12/1/88	75°N 150°W	100 x 200 m	NOAA
93	12/1/88	75°N 150°W	100 x 200 m	NOAA
94	12/1/88	75°N 150°W	100 x 200 m	NOAA
95	12/1/88	75°N 150°W	100 x 200 m	NOAA
96	12/1/88	75°N 150°W	100 x 200 m	NOAA
97	12/1/88	75°N 150°W	100 x 200 m	NOAA
98	12/1/88	75°N 150°W	100 x 200 m	NOAA
99	12/1/88	75°N 150°W	100 x 200 m	NOAA
100	12/1/88	75°N 150°W	100 x 200 m	NOAA



ICE EDGE

ICE EDGE

NORTHERN ICE LIMIT 08 DEC 66

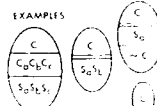
NAVY - NOAA JOINT ICE CENTER
NAVAL POLAR OCEANOGRAPHY CENTER, SUITLAND

C = Total ice concentration in the area in tenths;
 C_0, C_1, C_2 = Concentration of thickest (C_0), 2nd thickest (C_1), and 3rd thickest (C_2) ice;
 S_0, S_1, S_2 = Stage of development of thickest (S_0), 2nd thickest (S_1), and 3rd thickest (S_2) ice;
 $C_0, S_0, C_1, S_1, C_2, S_2$ = Concentration of ice within areas of strips and patches.

STAGE OF DEVELOPMENT (THICKNESS)

- 1 = New ice (0 - 10 cm)
- 2 = Young ice (10 - 20 cm)
- 3 = First year thin (20 - 30 cm)
- 4 = First year medium (30 - 40 cm)
- 5 = First year thick (40 - 50 cm)
- 6 = First year very thick (50 - 60 cm)
- 7 = Old ice (survived at least one summer)

EXAMPLES



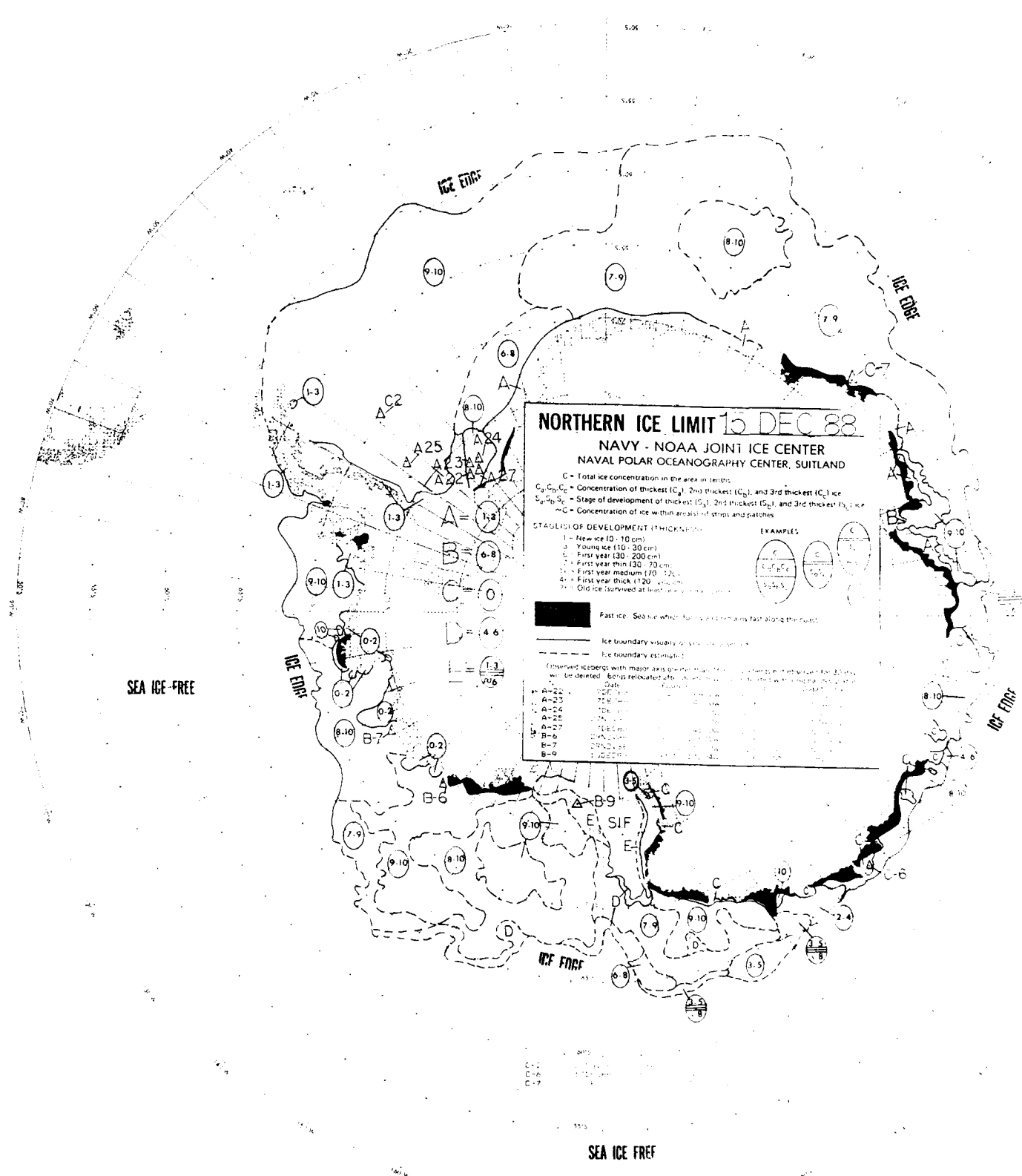
Fast ice: Sea ice which forms and remains fast along the coast.

Ice boundary visual and satellite observed.

Ice boundary estimated.

Uncharted icebergs with major icebergs shown. Icebergs not observed for 30 days or 100 miles. Below indicated after observation. Icebergs with major icebergs shown. Date: 08 DEC 66.

SEA ICE LIMIT

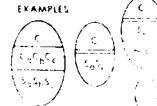


NORTHERN ICE LIMIT 15 DEC 88

**NAVY - NOAA JOINT ICE CENTER
NAVAL POLAR OCEANOGRAPHY CENTER, SUITLAND**

C = Total ice concentration in the area in tenths
 C₁C₂C₃ = Concentration of thickest (C₁), 2nd thickest (C₂), and 3rd thickest (C₃) ice
 S₁S₂S₃ = Stage of development of thickest (S₁), 2nd thickest (S₂), and 3rd thickest (S₃) ice
 ~C = Concentration of ice within areas of strips and patches

STAGES OF DEVELOPMENT (THICKNESS)
 1 - New ice (10 - 10 cm)
 2 - Young ice (10 - 30 cm)
 3 - First year (30 - 200 cm)
 4 - First year thin (30 - 70 cm)
 5 - First year medium (70 - 120 cm)
 6 - First year thick (120 - 200 cm)
 7 - Old ice (survived at least one winter)

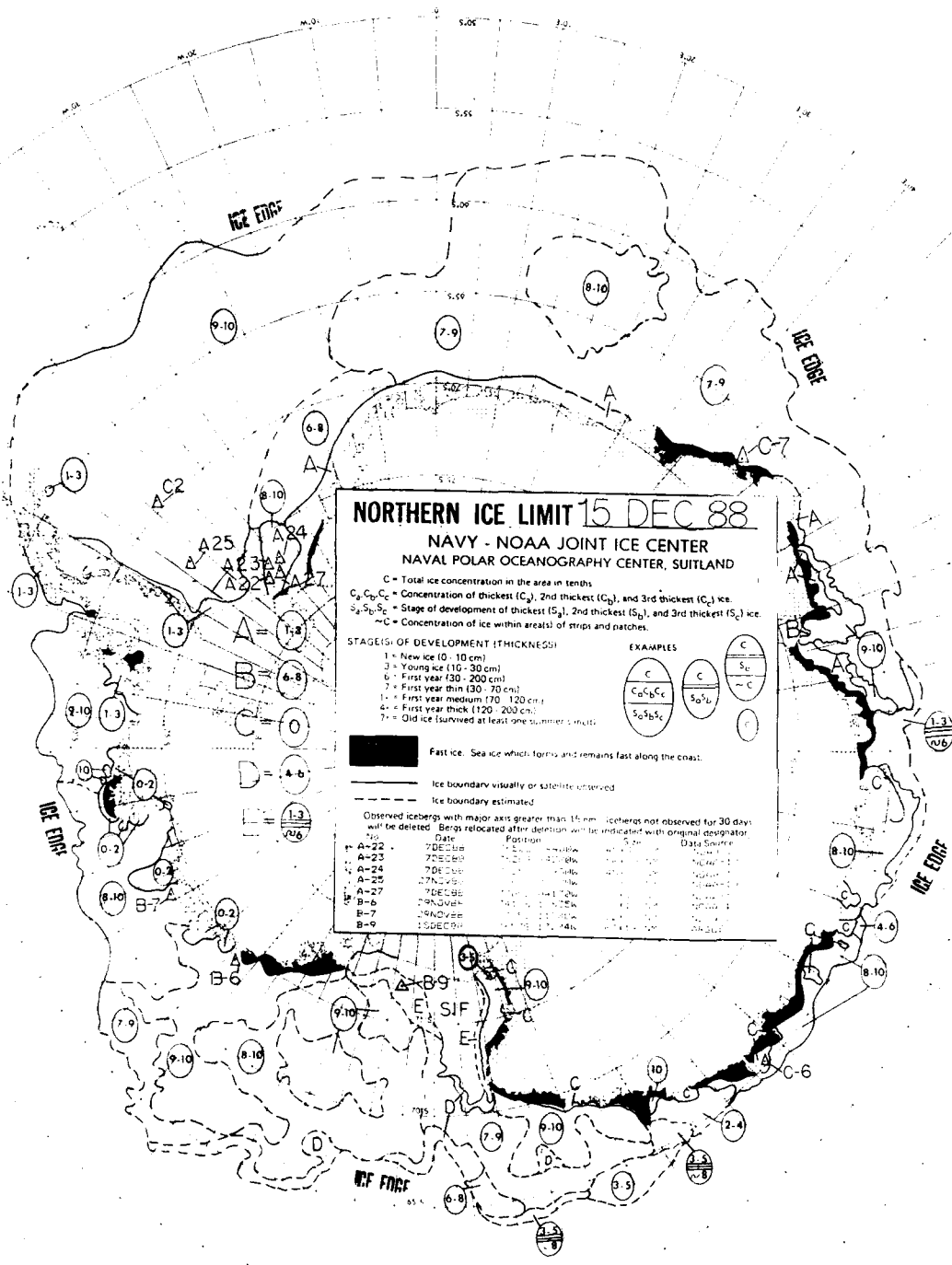


Fast ice - Sea ice which has been firmly fast along the coast.
Ice boundary visually observed
Ice boundary estimated

Observed icebergs with major axis greater than 100 m and minor axis greater than 50 m will be deleted. Bergs relocated after 1000 hours will be deleted with a note.

Code	Count	Area	Volume	Weight
A-22	100	1000	10000	100000
A-23	100	1000	10000	100000
A-24	100	1000	10000	100000
A-25	100	1000	10000	100000
A-26	100	1000	10000	100000
A-27	100	1000	10000	100000
B-6	100	1000	10000	100000
B-7	100	1000	10000	100000
B-9	100	1000	10000	100000

SEA ICE FREE

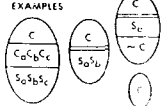


NORTHERN ICE LIMIT 15 DEC 88

NAVY - NOAA JOINT ICE CENTER
NAVAL POLAR OCEANOGRAPHY CENTER, SUITLAND

C = Total ice concentration in the area in tenths
C₁, C₂, C₃ = Concentration of thickest (C₁), 2nd thickest (C₂), and 3rd thickest (C₃) ice
S₁, S₂, S₃ = Stage of development of thickest (S₁), 2nd thickest (S₂), and 3rd thickest (S₃) ice
C = Concentration of ice within areas of strips and patches.

STAGE(S) OF DEVELOPMENT (THICKNESS)
1 = New ice (0 - 10 cm)
2 = Young ice (10 - 30 cm)
3 = First year (30 - 200 cm)
4 = First year thin (30 - 70 cm)
5 = First year medium (70 - 120 cm)
6 = First year thick (120 - 200 cm)
7 = Old ice (survived at least one summer melt)



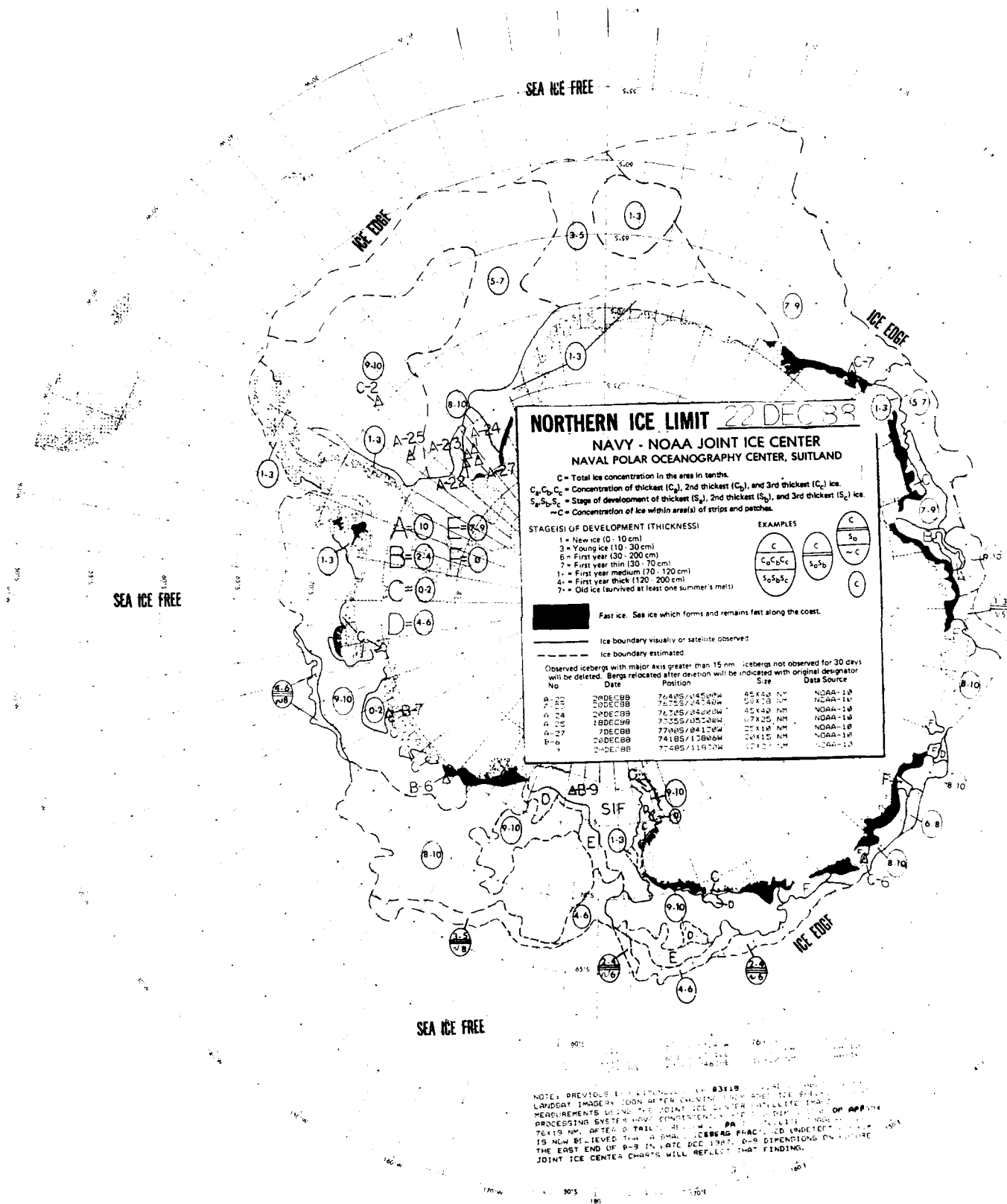
Fast ice: Sea ice which forms and remains fast along the coast.
Ice boundary visually or satellite observed
Ice boundary estimated

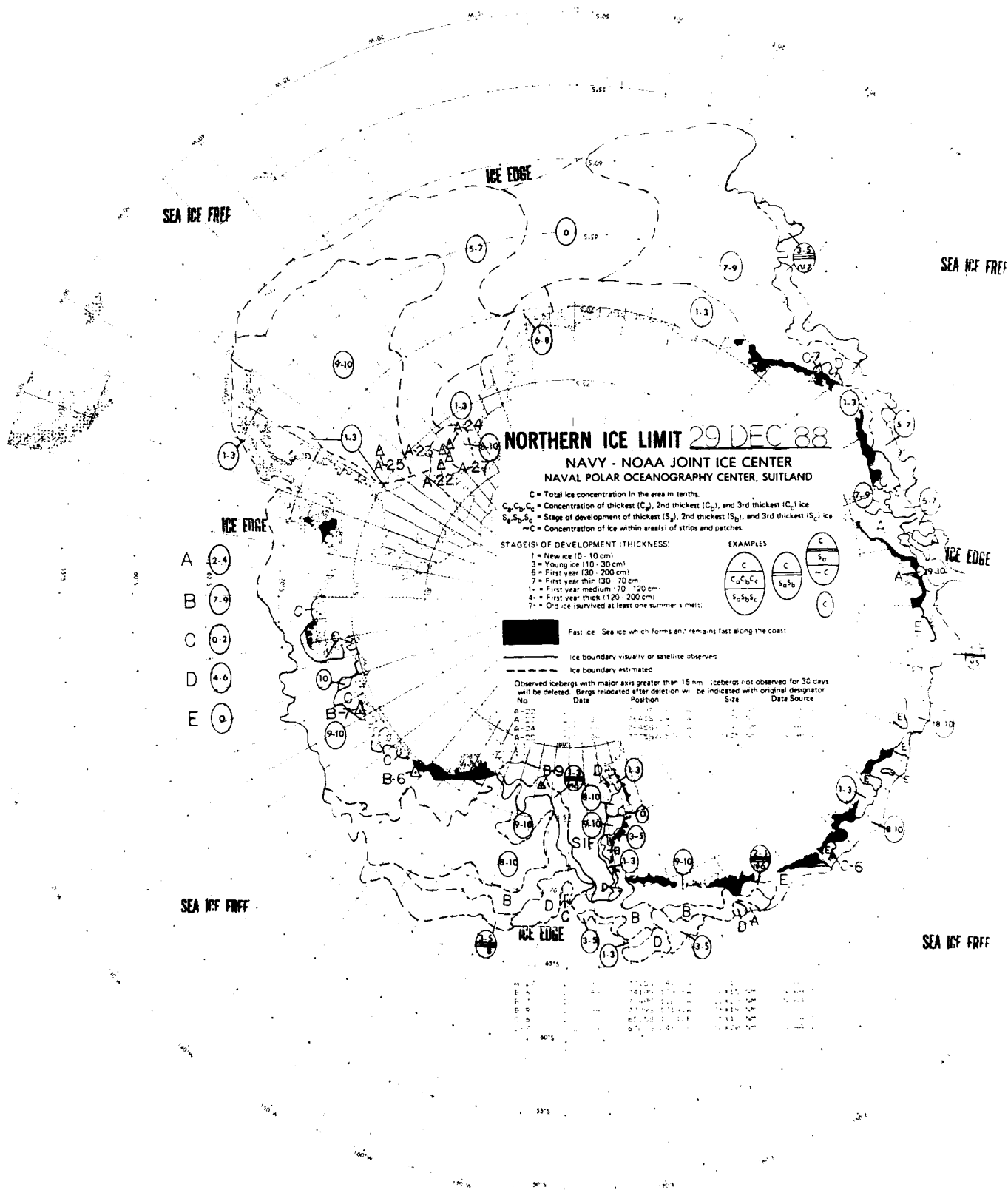
Observed icebergs with major axis greater than 15 nm. Icebergs not observed for 30 days will be deleted. Beris relocated after deletion will be indicated with original designator.

No.	Date	Position	Size	Data Source
A-22	7 DEC 88	66° 15' S, 150° 15' W	100 x 100	USN
A-23	7 DEC 88	66° 15' S, 150° 15' W	100 x 100	USN
A-24	7 DEC 88	66° 15' S, 150° 15' W	100 x 100	USN
A-25	7 DEC 88	66° 15' S, 150° 15' W	100 x 100	USN
A-26	7 DEC 88	66° 15' S, 150° 15' W	100 x 100	USN
A-27	7 DEC 88	66° 15' S, 150° 15' W	100 x 100	USN
B-6	29 NOV 88	66° 15' S, 150° 15' W	100 x 100	USN
B-7	29 NOV 88	66° 15' S, 150° 15' W	100 x 100	USN
B-9	15 DEC 88	66° 15' S, 150° 15' W	100 x 100	USN

SEA ICE FREE

SEA ICE FREE





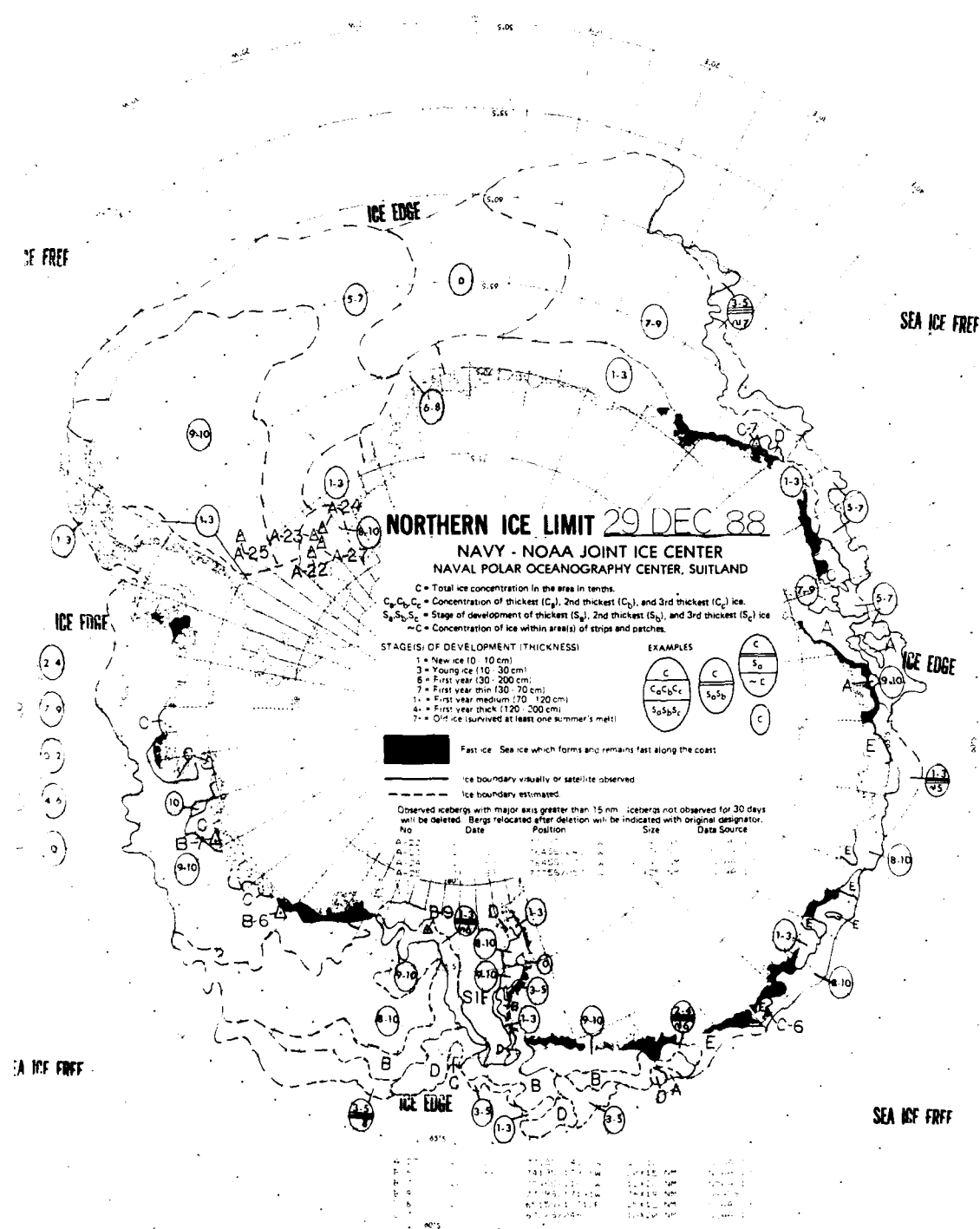


TABLE 1. SATELLITE DATA UTILIZED DURING 1978 AND 1988 (ANTARCTIC)

Time period		Satellite Remote Sensing				
From	To	Sensor Platform	Sensor Type	Spectral Region	Resolution	Coverage
1-87	3-87	NOAA-6	AVHRR			
			HRPT/LAC			
			VIS	0.58-0.68 um	1 km	Regional
			NIR	0.73-1.10 um		
			IR	10.5-11.5 um		
			GAC			
1-87	3-88	NOAA-9	AVHRR			
			HRPT/LAC			
			VIS	0.58-0.68 um	1 km	Regional
			NIR	0.73-1.10 um		
			IR	10.5-11.3 um		
			GAC			
1-87	12-88	NOAA-10	AVHRR			
			HRPT/LAC			
			VIS	0.58-0.68 um	1 km	Regional
			NIR	0.725-1.10 um		
			IR	10.5-11.5 um		
			GAC			
9-88	12-88	NOAA-11	AVHRR			
			HRPT/LAC			
			VIS	0.58-0.68 um	1 km	Regional
			NIR	0.725-1.10 um		
			IR	10.5-11.5 um		
			GAC			
1-78	10-87	NIMBUS-7	SMMR	0.81 cm	50 km	Global
				1.66 cm		
			VIS	0.4-1.1 um	3.7 km	Global
			IR	8.0-13.0 um	4.4 km	
			VIS	0.4-1.1 um	3.7 km	Global
			IR	10.2-12.8 um	4.4 km	
11-87	12-88	DMSP-F(8)	VIS	0.4-1.1 um	3.7 km	Global
			IR	10.2-12.8 um	4.4 km	
5-88	12-88	DMSP-F(9)	VIS	0.4-1.1 um	3.7 km	Global
			IR	10.2-12.8 um	4.4 km	
1-87	12-88	GEOSAT	Radar	Microwave	7 km	Regional
			Altimeter			

Abbreviations and Acronyms

AVHRR - Advanced Very High Resolution Radiometer
 cm - Centimeter
 GAC - Global Area Coverage
 HRPT - High Resolution Picture Transmission
 IR - Infrared
 km - Kilometer
 LAC - Local Area Coverage
 NIR - Near Infrared
 SMMR - Scanning Multifrequency Microwave Radiometer
 VIS - Visible
 um - Micrometer